

American Gas *Association* MONTHLY

Technical Research Progress

•
Accident Prevention Program

•
Atmospheric Burner Research

•
Gas Air Conditioning Design

•
Postwar Appliance Servicing

March



1944

VOLUME XXVI NUMBER 3

"What's Cookin'?"

*. . . that's awfully important to the boys
back from Guadalcanal or Italy!*

**... and modern GAS cooking
is helping skilled dietitians to use
food as medicine in
promoting recovery**

Hospitals have long looked upon food as a part of the medical picture. In fact, the essential values of food and special diets were first recognized in hospital work. With the building up of an Army and Navy, new emphasis was put on food from the nutrition standpoint.

The skilled medical staffs and dietitians assigned to our armed forces are seeing to it that the wounded and ill fighters get the best possible food for a fast recovery. In that picture, modern Gas cooking and baking with its speed, cleanliness, flexibility and accurate controllability is playing a tremendous part.

Meantime, if you need special help to maintain the Gas equipment you have at maximum efficiency, call your Gas company today.

AMERICAN GAS ASSOCIATION
INDUSTRIAL AND COMMERCIAL GAS SECTION
420 LEXINGTON AVENUE, NEW YORK 17, N. Y.




**American Gas
Association
MONTHLY**

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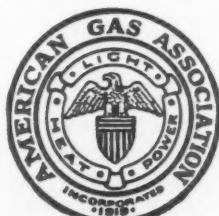


Two events of major importance to the gas industry are reported in this issue. They are the Cleveland technical research conference and the reorganization of the Association. Both are indicative of a spirit of change which permeates the gas industry and holds promise of great progress in the postwar period. . . . A stimulating story of technical progress was unfolded at the research conclave, the first of its kind devoted exclusively to domestic gas utilization. While all information presented was not new, frank and open discussion, particularly by the manufacturer representatives, went a long way toward bridging the gap between theoretical knowledge and practical achievement. . . . This pioneering conference will doubtless be the forerunner of other such meetings out of which should emerge a sound basic research policy known and understood by all. As one manufacturer succinctly stated: "The book of knowledge concerning the fundamentals of gas utilization is all too thin." . . . Realignment of the A. G. A. setup is designed to increase its service and value to all classes of its membership. Creation of two departments was overwhelmingly approved by the members and results are awaited with keen anticipation.

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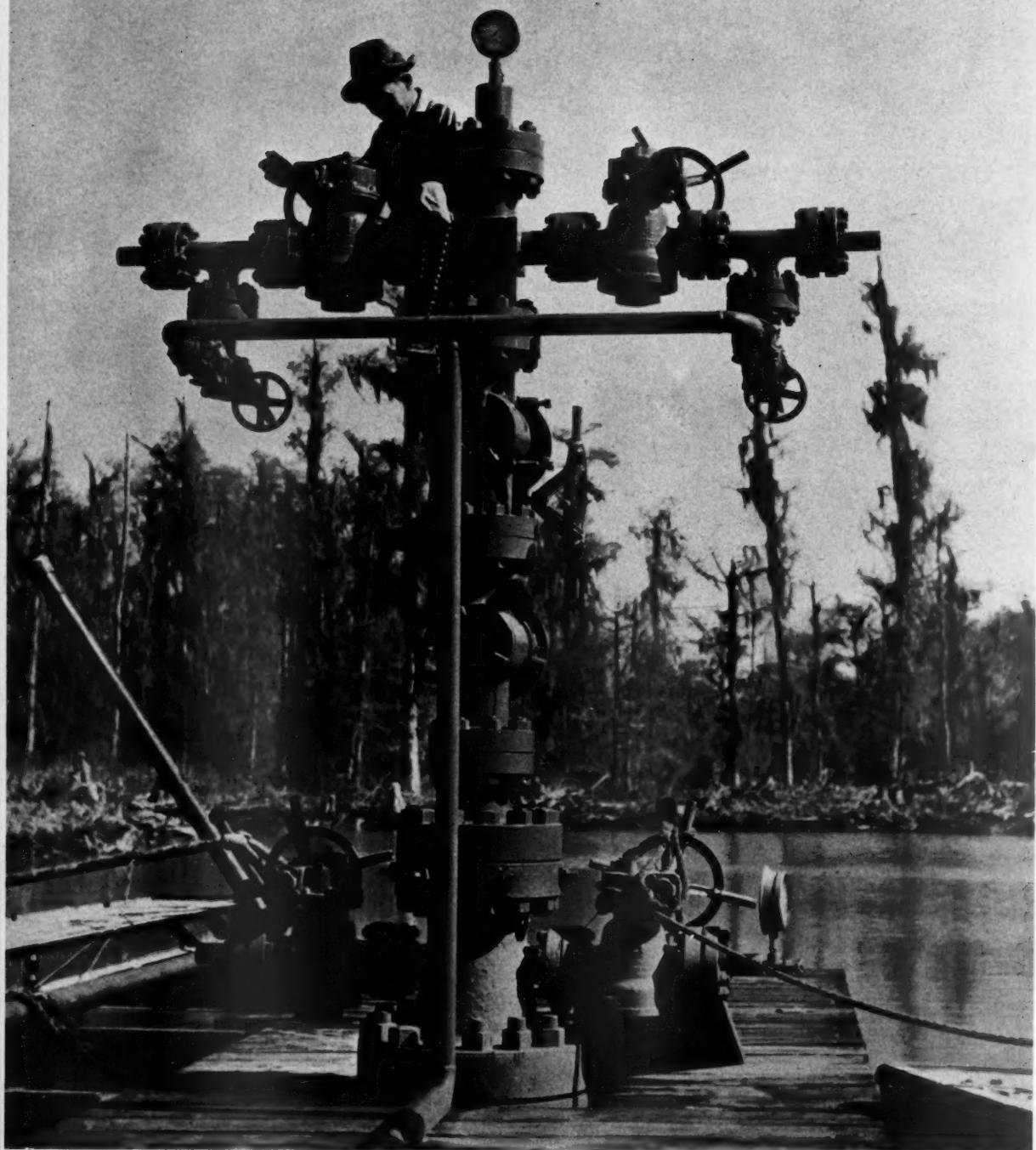
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A meter and well attendant sits astride the "Christmas tree" on the Fitzpatrick-Vizard Unit No. 1 well—one of the deepest producing wells in the world. Located in the DeLarge gas field, Louisiana, the well produces from a plug-back depth of 13,490 feet. The natural gas is utilized by means of a 19-mile, 12-inch pipe line recently constructed by the United Gas Pipe Line Company. This *MONTHLY* prize-winning photograph was taken by L. F. Van Houten, editor of the *United Gas Log*.



JAMES M. BEALL, *Editor*

GAS RESEARCH

... Technological Progress Reviewed in Cleveland

TECHNOLOGICAL progress in the important field of domestic gas research was made the subject of a two-day conference held in Cleveland, Ohio, February 17 and 18, and attended by engineers, designers and other technicians of gas appliance and related equipment manufacturing companies as well as executives of gas companies and appliance companies.

The conference, officially termed the American Gas Association Technical Conference on Domestic Gas Research, was designed to acquaint engineers and members of the technical staffs of appliance manufacturing organizations with the technical aspects of the fundamental research sponsored by the Association's Committee on Domestic Gas Research and with the most advanced thought in this field. Everett J. Boothby, vice-president and general manager, Washington Gas Light Company, is chairman of this committee. F. M. Banks, vice-president, Southern California Gas Co., is vice-chairman, and Eugene D. Milener, secretary.

Opening the conference with brief introductory remarks, Mr. Milener emphasized its pioneering nature, pointing out that it was the first time the gas industry had held a general conference devoted exclusively to research. The primary purpose, he said, was to stimulate engineers and others to appraise properly the true technical utilization problems facing the industry. "On our ability to solve these technical problems depends absolutely the advance or stagnation of future gas appliances in the home."

Mr. Milener then introduced John J. Quinn, general sales manager, Boston Consolidated Gas Co., who presided at the Thursday morning session. Thereafter technical papers covering the technique of advancing atmospheric gas burner design and noise and heat transfer factors in the design of gas heating appliances were presented by F. E. Vandaveer, K. H. Flint and W. R. Teller of the A. G. A.

Laboratories. Mr. Vandaveer's paper is reproduced in full elsewhere in this issue.

Everett J. Boothby, chairman of the A. G. A. Committee on Domestic Gas Research, presided at the Thursday luncheon at which Frank H. Adams, general manager, Surface Combustion, Toledo, was the principal speaker. Mr. Boothby described the objectives of his committee and gave a brief history of its background. He said the results of the research work accomplished to date speak for themselves. The purpose of the conference, he declared, was summed up very well by a prominent gas range manufacturer who said, "I hope the conference will bring about an exchange of views among the engineers who will be present. The book of knowledge concerning the fundamentals of gas utilization is all too thin."

Mr. Boothby declared that the information brought out during the conference would in no way encroach upon the patents held by manufacturers. "If any manufacturer feels we have gone off the reservation I wish he would tell me," he said.

Talking to a luncheon audience that numbered almost 300 individuals, Mr. Adams said it was extremely important for everyone to know the policy of the gas industry in reference to research—how much of it is being done and whether or not it matches the research programs of competing industries. He said the American Gas Association is now appropriating some 40% of its income for research of various types.

"The principal objective of this domestic gas research program," Mr. Adams declared, "is to better gas appliances. In carrying out the objectives we face a double challenge. First, we must make sure the work is technically sound and, it must not only be useable, but it must be used. The gas companies must support this program and take such action



Inspecting the Laboratories' exhibit during the conference. Left to right: F. A. Vandaver, Cleveland; H. W. Geyer, Los Angeles; Everett J. Boothby, Washington, conference chairman; and H. L. Warren, Los Angeles



W. R. Teller explaining war products to C. F. Turner, Cleveland; James A. Brown, New York; H. N. Mallon, Bradford; N. B. Bertollette, Hartford; Hudson W. Reed, Philadelphia; Henry R. Cook, Jr., Baltimore; and L. B. Wilson, Jr., Baltimore



R. M. Conner, director, A. G. A. Laboratories, showing President Ernest R. Acker, of Poughkeepsie, research apparatus

as will make it thoroughly effective."

Mr. Adams cited four fundamentals that should be considered in a long-term consideration of gas appliance research, as follows:

1. Gas cannot be sold except through appliances. These determine type and quality of service.
2. Utilities have the greatest stake in research because of their huge investment.
3. Utilities need a sound, loyal appliance manufacturing industry. There are too many appliances built by companies as a sideline—too many complaints as a result of poor appliances.
4. Development of appliances can best be done by manufacturers.

In closing his address, Mr. Adams made a plea that gas companies should support the appliance manufacturers who do research work. Top management, he said, needs to be sold on this. He stated further that the volume of sales of gas appliances is much too low for a healthy appliance industry and declared that both the appliance manufacturers and the utilities should be concerned about this situation.

In answering the question "What is the best policy to pursue in research?" Mr. Adams said, "It is not a question of fundamental or applied research, but a matter of stimulating all manner of research throughout the gas industry and bringing forth, as a result, values measured in tangible form."

Mr. Adams also occupied the chair at the afternoon session which considered practical phases of fundamental gas cooking and gas water heating research as presented by F. E. Vandaver and K. R. Knapp of the A. G. A. Laboratories and W. R. Fraser, a member of the Technical Advisory Sub-

committee for Gas Water Heating Research.

H. W. Geyer, utilization engineer, Southern Counties Gas Co., Los Angeles, and member, Technical Advisory Subcommittee for Gas Water Heating Research, presided at the Friday morning session at which additional papers covering design and performance features of post-war gas burners and fundamental gas water heating research were presented by Leon Ourusoff, member of the Technical Advisory Subcommittee for Gas Cooking Research, and W. R. Teller and F. R. Wright of the A. G. A. Testing Laboratories.

At the Friday luncheon, Chairman Boothby introduced the chairmen of the three Technical Advisory Subcommittees who were to preside at the afternoon panel sessions. These were Paul R. Tappan, Cooking; L. R. Mendelson, Water Heating, and Keith T. Davis, Central Space Heating.

First speaker on this occasion was R. M. Conner, director, A. G. A. Laboratories, who reviewed the Laboratories' part in carrying out the assignments of the Committee on Domestic Gas Research and expressed his appreciation of the enthusiastic manner in which the technical material presented at the conference had been received. He pledged the full cooperation of the Laboratories' staff in carrying out future assignments and said that his staff had gained immeasurably from the conference discussions.

In introducing Lyle C. Harvey, president, The Bryant Heater Co., and senior vice-president, Association of Gas Appliance and Equipment Manufacturers, Chairman Boothby pointed out

Speakers' table at the Thursday luncheon at which Chairman Everett J. Boothby presided and Frank H. Adams was the featured speaker. Left to right: E. H. Eacker, Boston; Alexander Forward, New York; Marcy L. Sperry, Washington; J. French Robinson, Cleveland; Mr. Adams, Toledo; Chairman Boothby; H. Carl Wolf, Atlanta; John J. Quinn, Boston; R. M. Conner, Cleveland; Eugene D. Milener, New York; H. Leigh Whitelaw, New York; and Lyle C. Harvey, Cleveland





View of second luncheon meeting, Friday, at which R. M. Conner and Lyle C. Harvey spoke. Left to right at the speakers' table are: H. Leigh Whitelaw, Eugene D. Milener, Mr. Conner, Mr. Harvey, Chairman Boothby, Paul R. Tappan, L. R. Mendelson, Keith T. Davis, H. W. Geyer, and William R. Teller

that he was a far-sighted and successful appliance manufacturer who understood the gas utility industry because he had grown up in it. Speaking for the manufacturers, Mr. Harvey said that the conference had proven a practical means of bridging the gap between the fundamental research of the Association and the practical problems of the manufacturers. He predicted that immediate postwar appliances would be based chiefly on prewar engineering but that soon afterward advanced designs, based on current research, would appear.

Mr. Harvey discussed the economic problems of gas appliance manufacturers but declared that big markets would open up in replacements and in new houses. In conclusion, he asked all manufacturers present to appraise the conference and notify Chairman Boothby of the features most valuable to them.

The three panel discussions on Friday afternoon had a full attendance and the research pertaining to individual subjects was freely and fully discussed. Particular attention centered on problems involved in translating and applying fundamental research data to help in producing better gas appliances.

The A. G. A. Laboratories in Cleveland were opened on the morning following adjournment of the conference and were visited by a large number of persons who consulted with the staff and inspected domestic gas research set-ups and data.

A valuable attraction at the conference was an operating exhibit at the Hotel Statler staged by the A. G. A. Laboratories. The exhibit featured new ideas in gas burners and burner performance, aeration, ignition, venting, control, heat distribution, etc.

A similar conference conducted by the A. G. A. Committee on Domestic Gas Research in cooperation with the Pacific Coast Gas Association will be held at the Ambassador Hotel, Los Angeles, March 15 and 16.

A BRITISH VIEW of A. G. A.'s Record

(*Gas Journal*, London, January 5, 1944)

The American Gas Association held its twenty-fifth annual meeting towards the close of last year, and by all accounts it was a highly successful gathering. The Association was created in 1918 through the merging of organizations representing the technical, sales, and appliance manufacturing branches of the industry, and the past quarter-century has brought great progress and many changes. The natural gas side has grown from serving 2,500,000 consumers in 1918 to 8,500,000 consumers in 1943; the manufactured gas side, while not enjoying such spectacular growth, gained 67% in consumers during this period. Total gas sales in 1942 showed an increase of nearly 250% over 1918.

And in all this vast development work the A. G. A., on the activities of which we have often had cause to comment favorably in our columns, has played a leading part. The situation in 1918 required a united front and the subordination of individual objectives, and undoubtedly the A. G. A. has done much to present such a front. That more could be done in concert, however, was stressed by the President, Mr. Arthur Bridge, who called for greater unity in dealing with readjustments during the transition from war to peace—readjustments which in his opinion are likely to be drastic and unpleasant. In his own words, "only vision, intensive analysis, and careful planning can steer us safely through the ordeal of reconversion and accomplish a sound economic readjustment."

The President's Address, which we have read with much interest was quiet in tone, not at all in the nature of a panegyric of the Association, not at all boastful. But his references to the Association's work did indicate how strong the A. G. A. has in fact become during the first twenty-five years of its life, and what virility marks its present mood. Under wartime conditions U. S. A. government departments have not been slow to seek its aid and have not been tardy in recognizing the help given. It has acted and continues to act smoothly as an alert and competent liaison.

On the technical side the A. G. A. laboratories, the principal function of which in peacetime was the testing of gas appliances in the interest of the gas consumer, are now engaged largely on very different tasks of research and development in connexion with the war effort. But in addition to what we may term purely war work, the laboratories are carrying out a gas research programme on a scale greater than at any other time in their history—which is surely a matter for some envy as well as congratulation.

During recent months further funds have been allocated to speeding up research on domestic utilization. Without entering into the question of what relationship exists between mass attack on specific problems and results achieved, we would mention that to-day, in the throes of war, this work is being conducted at a rate four times that of a few months ago. The staff has been augmented, for the most part by women graduates. The aim, of course, is improved appliances and technique when the war is over. No one, we think, would grudge what in this regard may be called the Association's luck. We ourselves, while congratulating the Association on its achievements during its first quarter of a century admire the efficiency of its organization, and feel that we in this country stand to benefit by its work, the continued and growing success of which can be confidently anticipated.

A.G.A. Reorganization ... Board Sets Up Natural and Manufactured Gas Departments



J. French Robinson
Chairman, Natural
Gas Department

setting up a Natural Gas Department and a Manufactured Gas Department. These plans call for extensive changes in the Association's structure and for reorganization of various committees. Their purpose is to increase the usefulness of the Association to all its members and enlarge its opportunity to be of service to the industry.

As now constituted, the Constitution provides for a Natural Gas Department and a Manufactured Gas Department, each with a vice-president of the Association as chairman. The vice-presidents will serve as ex-officio members of the Finance and Control Committee. J. French Robinson, vice-president of the Association and president of The East Ohio Gas Company, is chairman of the new Natural Gas Department which succeeds the Natural Gas Section of which R. E. Wertz, president, Amarillo Gas Company, was chairman. George S. Hawley, president, The Bridgeport Gas Light Company, and past president of the Association, is chairman of the Manufactured Gas Department.

Natural Gas Department

In accordance with the plan approved by the Executive Board, the Natural Gas Department will be headed by a Managing Committee with Mr. Robinson, in his capacity of vice-president and chairman of the Depart-

ment, acting as chairman. There will also be an Advisory Committee, a Nominating Committee and a director of the Department. The director of the Department will be a full-time employee of the Association and will have the additional post of assistant managing director.

Five main departmental committees have been established as follows: (1) Production and Storage, (2) Transmission, (3) Accounting, (4) Large Volume Sales, and (5) Technical and Research.

The Production and Storage Committee will handle matters relating to the producing of gas from wells, its storage and all related problems. It replaces the former "Production Committee" and recognizes the increasing importance and development of underground storage of natural gas.

Transmission Committee

Transportation of large volumes of natural gas from regions of abundant supply to markets often far removed, resulting in the construction of large diameter steel pipe lines operating at high pressure, makes the work of the Transmission Committee of far-reaching importance. The design, construction and operation of such lines call for an engineering knowledge of materials and methods of the highest order. The subcommittees listed on the accompanying chart are indicative of the component parts of a transmission system and are intended to indicate need for additional information in the further development of the art.

An Accounting Committee was set up because certain operations in the natural gas business are peculiar to it. Depletion and underground storage are examples.

In organizing a Committee on Large Volume Sales it was recognized that industrial gas sales in very large volumes generally constitute a much larger percentage of a natural gas company's

total sales than they do of a manufactured gas company's. It was also felt that they take in classes of business not usually covered specifically in the Industrial and Commercial Gas Section.

The Technical and Research Committee continues the functions of the former "Main Technical and Research Committee." It will initiate and conduct research on production, storage and transmission and provide standards and methods for the qualitative and quantitative determination of gas components and products. It will also build up technical knowledge of the business through the medium of publications, fellowships at technical schools, etc.

Committees Transferred

The reorganization also involved the transfer of a number of committees. The Wrinkle and Wrinkle Award Committees have been made general committees of the Association as has the Committee on Vocational Education. The Residential Sales Committee becomes a subcommittee in the Residential Gas Section and the Industrial and Commercial Sales Committee is transferred to the Industrial and Commercial Gas Section. The Accident Prevention Subcommittee is now a part of the general Accident Prevention Committee with representation from the Production and Storage, Transmission and Technical & Research Committees.

As in the past the Natural Gas Department will hold a meeting in the Spring of each year and its annual meeting at the same time and place as the annual meeting of the Association.



George S. Hawley
Chairman, Manufactured Gas Department

The Supply Men's Fund and the related Fellowships will be continued as formerly, and the Department will maintain its policy of cooperation with state and regional associations and with the Measurement Short Courses at Norman, Okla., and Morgantown, W. Va.

The new organization plan calls for more publicity regarding the advantages of membership and greater participation by the Natural Gas Department in all activities of the five Sections of the Association.

Manufactured Gas Department

The report of Chairman Hawley for the Manufactured Gas Department as approved by the Board called attention to the report of the Special Committee on Organizational Changes which concluded "that few, if any, changes in organizations or functions will be required to bring them into conformity with the proposed Association reorganization plan. In the case of the Technical Section some changes will be necessary."

The report continues:

"With this in mind the officers of the Technical Section at the direction of the Executive Board continued with its regular organization procedure, completed its committees for 1943-44, and approved the activi-

ties proposed by the several committee chairmen, subject to possible rearrangement of some of the Sectional committee personnel and the Departmental affiliations of some of the committees.

"From an operational and control point of view, having first received the approval of the Executive Board, it would seem that the first order of business to ensure properly coordinated progress is the appointment of a Managing Committee for the Manufactured Gas Department.

"The members of this committee should be representative men selected from manufactured gas companies, qualified and experienced in various phases of the industry's problems. Care should also be taken to avoid over-representation of individuals or company representatives on the Association's several committees of this Department, although it may be desirable to see that each of the Sections is represented in an appropriate manner."

Closely following the procedure heretofore announced, Chairman Hawley's report announced, as part of the set up, a vice-president and chairman of the Managing Committee, an Advisory Committee composed of past chairmen and activities of the Gas Production Committee and of the Gas Conditioning Committee. Special attention was called to the substantial interest of the Manufactured Gas Department in the membership and activi-

ties of many Sectional Committees including those of Residential Gas, Industrial and Commercial Gas, Technical and Accounting Sections; also in such general committees as Publicity and Advertising, Rates, Postwar Planning, Personnel Practices, Accident Prevention and Research.

Finally it is provided that the Managing Committee may at any time appoint additional committees on manufactured gas problems. All activities are subject to the jurisdiction of the Executive Board.

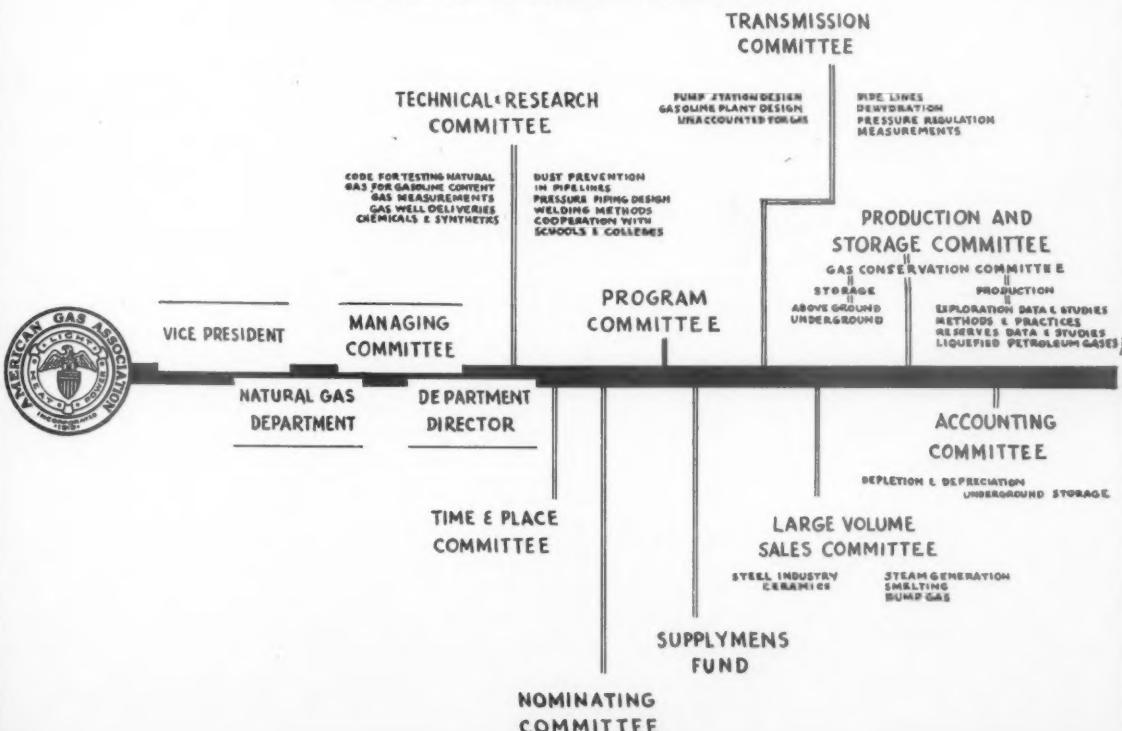
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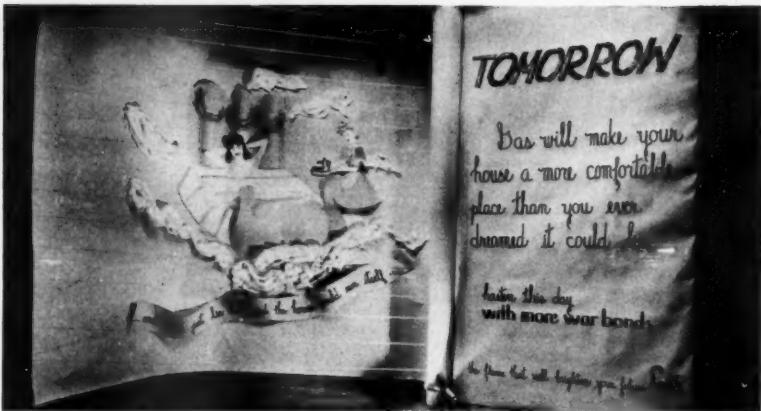
WAR or no war, Hitler, Hirohito, and their gangs notwithstanding, the A. G. A. MONTHLY (for what it's worth) reaches its overseas readers. R. Baker of Manchester, England, reports as follows:

"I thought you may like to know that, upon checking my files of A. G. A. MONTHLY, I find I have safely received every single issue published since the outbreak of war in September, 1939.

"Having regard to the heavy sinkings of merchant shipping as regularly published from time to time until the more recent successes in the Allied fight against U-boat warfare, it would seem that A. G. A. literature has consistently been immune against loss, or the hand of Providence has always steered it safely to its final destination."

NATURAL GAS DEPARTMENT ORGANIZATION





Window display of the Portland Gas & Coke Company, Portland, Oregon, which adopts the theme of a recent A. G. A. national gas advertisement. Designed by Keith Hoppe, displayman, clouds are represented by cotton batting, with additional "depth" accomplished through the use of cut-out pieces for the head and foot of the bed, skirt, etc.

Headliners Scheduled for Rochester Industrial Gas Conference



Charles G. Young

mass feeding; second, in reconversion and rehabilitation; and, third, in postwar industry and commerce.

Headliners at the Rochester Conference will include Clarence Birdseye who will talk on "Trends in Prepared, Frozen and Dehydrated Foods." Brigadier General Hermon F. Safford, Chief of Production Service Branch, Office of the Chief of Ordnance, Washington, D. C., will discuss the present conditions of fuels in war production and the probable requirements for the remainder of the war. The title of General Safford's paper is "American Armament on the Battlefronts."

Herman Russell, president, Rochester Gas and Electric Corp., Rochester, in his talk on "Problems of Management in War-



Herman Russell

time" will bring the views of one of the country's most outstanding utility executives. Dr. C. K. Mees, vice-president in charge of research, Eastman Kodak Company, who is an eminent scientist and director of one of the world's largest and most successful organizations, has a message of unusual interest at this time to gas men. His paper is entitled "Scientific Research and Its Relation to Industry."

The conference will be opened by the Chairman of the Industrial and Commercial Gas Section, Charles G. Young, manager, Springfield Gas Light Company, who will speak on "Progress of Industrial and Commercial Gas and Its Contribution to the War." Mr. Young will point out some lessons that can be learned in gas utilization based upon our war production experience. In a paper entitled "Gas Air Conditioning Brought Up-To-Date—A Report and Analysis" Walter F. Friend, mechanical engineer, Ebasco Services Inc., will present a complete tabulation and analysis of the operation and performance of commercial and residential gas air conditioning installations that were operating last summer.

Robert C. LeMay, industrial engineer, The Connecticut Light & Power Co., will present the results of his studies of industrial gas equipment in colleges under the title "What Do the Colleges Think of Gas Equipment?"

William R. Teller, chief research engineer, A. G. A. Laboratories, will present new information on large and small gas immersion tubes, and Frank H. Trembley, Jr., assistant sales manager, The Philadelphia Gas Works Co., will make a presentation on behalf of the Food Service Equipment Committee.

Edward N. Strait, manager, rate and research division, Public Utility Engineering and Service Corp., and chairman, A. G. A. Rate Committee, speaking on "Value of Commercial and Industrial Gas Load to Utilities," will make a valuable contribution to a subject which has been viewed from many angles.

On the technical side, Carroll Cohn, development engineer, Surface Combustion, will present a paper entitled "New Horizons for Industrial Gas." Mr. Cohn will help us take a practical look into the near future, while C. George Segeler, utilization engineer, American Gas Association, will present a new analysis of aluminum and magnesium heat treating, laying particular emphasis on describing the work that is now getting under way in the melting field.

Looking into the future, F. B. Jones, general sales manager, Equitable Gas Co., will talk on "Rebuilding the Industrial and Commercial Gas Sales Personnel." Mr. Jones is one of the best-qualified men in the country to speak on this subject. The problems of reconversion will be many and Karl Emmerling, assistant general superintendent, The East Ohio Gas Co. and J. P. Leinroth, general industrial fuel representative, Public Service Electric & Gas Co., will analyze factory reconversion problems and problems relating to the rehabilitation of badly worn-out food service equipment. Mr. Emmerling will speak from the standpoint of natural gas companies and Mr. Leinroth from the standpoint of manufactured gas companies.

In order to determine what effect the great amount of work being done throughout our industry with respect to new materials, new manufacturing processes, new methods of preparing food, Lawrence E. Biemiller, assistant manager industrial fuel department, Consolidated Gas Electric Light & Power Co. of Baltimore, will describe "The Impact of New Equipment and New Processes on the Use of Gas." Still looking into the future, Hall M. Henry, vice-president, New England Gas & Electric System, and member of Postwar Planning Committee, will give his answers to "What Do We Require for the Full Realization of our Objectives in the Commercial and Industrial Gas Fields?"

Getting down to brass tacks on a subject that is now a reality, John Avery, assistant manager, Blower and Compressor Department, Allis-Chalmers Company, will speak on gas turbine progress. Coming from the leading manufacturer of gas turbines this will be a realistic appraisal of accomplishment and future prospects, particularly prospects toward smaller gas turbines.

Safety Time Is Now . . . What Are You Doing To Aid Accident Prevention Program?



George J. Ruoff

ACCIDENT prevention is a subject which is mentioned enough to be a lot like the weather. Most folks gladly talk about it, but too few actually do anything about it except give it "lip" service. Of course, the real difference is that in the latter case little except talking can be done, while in the former case the only practical limitation is the amount of genuine determination to do a job well. It's just as simple as that!

Only a moron could honestly say that he was *not* interested in saving human suffering, cutting down the inefficiency reflected by accidents (including the vast majority of accidents that do not result in injuries); financial loss to the company and to the employees where injuries result; social disturbance to injured's family where death, permanent or partial disablement results; saving critically needed skilled man power to win the war, etc.

Job for Everyone

Our Accident Prevention Committee particularly is appealing to those who supervise (from top management to the humblest foreman or squad leader) from whom this determination to do a job well must come. We therefore ask you the following questions: How can we give greater help to you in this phase of your job? Do you know of the numerous studies, reports, posters, awards, that through this committee have been made available to the industry? Have you made effective use of the material sent you through our committee? Do you know what is

By GEORGE J. RUOFF*

Chairman, Accident Prevention Committee

meant by accident frequency and how your particular frequency rate compares with other companies in the gas industry?

Inquiries have already been sent out to enable us to plan a program of constructive effort for the coming Association year. We solicit any problem involving health or safety of your employees or the public on which you need help.



It has been said that certain individuals have forgotten more than other individuals ever would know. As far as any company is concerned, that which is forgotten or not utilized to its fullest extent represents definite wasted energy.

It is felt that a review of the committee's general objectives might serve a useful purpose to remind member companies of the services available in addition to the safety subjects just mentioned.

The Thomas N. McCarter Medal, Bar, Certificate of Assistance, and Certificate of Recognition are available to any employee of a member company who, in the opinion of the members of the Accident Prevention Committee, fulfills certain requirements in conjunction with the utilization of the Prone Pressure Method to successfully resuscitate a victim of asphyxiation by utility gas. Attention is directed to one

specific requirement that application must be filed at A. G. A. headquarters within one year of the date on which the resuscitation occurs.

Foremen's safety messages, published by a subcommittee, are released to all member companies. They serve a very useful purpose by emphasizing the supervisor's responsibility for establishing safety as a definite part of the operating program and also by pointing out how the foreman can maintain the interest of the employees under his supervision in accident prevention activities. Many companies have found these messages so worthwhile that they have reproduced them over the signature of an operating manager or executive and distributed them to all of the supervisory force. Other companies reproduce and publish the messages in their company house organs. Both of these methods have proved to be very effective. The subcommittee on publicity has released to the A. G. A. MONTHLY articles on safety as well as specific articles describing particular subjects.

Accident Prevention Awards

The committee also supervises the Million Man-hour Safety Award for companies or units thereof that operate one million or more man-hours without a disabling injury. The award particularly recognizes an outstanding performance in accident prevention. The committee has under consideration the establishment of an additional award to stimulate accident prevention in smaller companies that find it very difficult or impossible to strive for the present Million Man-hour Award.

Each year our committee solicits applications for the Meritorious Service Medal which is available to employees of member companies who have shown outstanding merit, conspicuous judgment, intelligence or bravery in the saving of human life either in

* Safety Director, Central Hudson Gas and Electric Corp., Poughkeepsie, N. Y.

the plant or works of any gas undertaking or having to do with the handling of the materials or products manufactured or distributed by any member gas company.

One of the primary functions of the Accident Prevention Committee is to consider the approval of safety devices and protective equipment used by the gas industry.

Following are the primary objectives of the Accident Prevention Committee:

- (1) To provide a medium for the exchange of information between member companies' safety representatives on accident prevention problems.
- (2) To keep member companies informed in regard to new developments in the field of accident prevention.
- (3) To stimulate interest in accident prevention within the gas industry.
- (4) To serve as an advisory and consulting agency on information and material released by the National Safety Council and other organizations on the safe handling and safe use of gas.
- (5) To gather information regarding accident experience within the industry and to prepare and distribute comparison-reports, charts, etc.
- (6) To study and test new safety devices and personal protective equipment and advise the industry the results of such studies.
- (7) To assist individual member companies in an advisory capacity on any specific accident prevention or health problem that may come to the committee's attention.
- (8) To develop recognition of material and factual data on special safety subjects for release to member companies as the need for same develops.
- (9) To work closely with the Association's medical advisor on any specific health problems that arise which might affect the gas industry.
- (10) To recognize outstanding accident prevention achievement of member companies by awarding "The Million Man-hour Certificate" above described.
- (11) To administer the McCarter Medal and McCarter Sundry Awards as well as the Meritorious Service Medal.
- (12) To assist and cooperate in planning the program for the general Association meetings.

ACCIDENT PREVENTION COMMITTEE

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 Roy M. Godwin, Philadelphia Electric Co., Philadelphia, Pa.
 Cecil L. Hightower, United Gas Pipe Line Co., Shreveport, La.



Members of the Accident Prevention Committee at a meeting in New York City, February 25. Left to right, seated: Roy M. Godwin, George L. Ruoff, chairman; F. W. Fisher, and H. H. Berman. Standing: H. J. Burton, Charles Koons, E. C. Baumann, E. S. Miner (guest); I. R. Dobb (guest); H. T. Jayne, D. Whitcomb,* John W. West, Jr., L. K. Richey,* P. A. Alberty (representing Ohio Gas and Oil Association); D. C. Stewart, W. R. Smith (guest); Dave M. Eckman (representing Michigan Gas Association); and W. T. Rogers*

(* Technical Section representatives)

material and factual data on special safety subjects for release to member companies as the need for same develops.

- (9) To work closely with the Association's medical advisor on any specific health problems that arise which might affect the gas industry.
- (10) To recognize outstanding accident prevention achievement of member companies by awarding "The Million Man-hour Certificate" above described.
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- (12) To assist and cooperate in planning the program for the general Association meetings.

Natural Gas Meeting To Be Held in May

A NATURAL Gas Spring Conference will be sponsored by the Natural Gas Department, American Gas Association, on May 11, 12 and 13, 1944, at French Lick Springs Hotel, French Lick, Indiana.

The program has not yet been completed but it is expected that it will include a symposium on the storage of natural gas and one on long distance transmission of natural gas. All phases of these studies will be considered and speakers will be selected from sections of the country in which such problems are of particular interest.

Internal Cleaning of Natural Gas Pipe Lines

PRESENT conditions have increased the necessity for efficient operation of our pipe lines. The demands for natural gas from our system have increased 50% in the last three years while the supply of steel available for construction is limited.

The December, 1941, issue of the *United Gas Log* carried a story on "That Gol Durn Rabbit," covering our first year efforts to improve delivery capacity by internal cleaning of pipe lines.

Work on the idea began in 1940 with forecasts of daily loads which would run in excess of one billion cubic feet, and has expanded with the estimates. A table is published on the next page showing the annual operations in which scrapers, brushes, and swabs have traveled through 2,003 miles of pipe to clean 647 miles of line.

These totals do not include new construction where the method was applied before the line was put into service.

Improvement in Efficiency

In every case improvement in efficiency has been reported. By referring to the curve in Figure I the gain determined from capacity tests can be expressed as miles of required equivalent construction. The economic justification of interior pipe cleaning is clearly shown by comparing the cost with that necessary for construction to obtain equal results.

For a number of years excess pressure drop reports had revealed that the 54 miles of 16-inch line from Jackson to the Bogalusa Tap was operating at a low efficiency. All fluid was removed by means of siphons, so that in June its capacity had risen to 96% of Weymouth's flow formula on a flow-rate of forty-three million cubic feet per day.

Reprinted from the *United Gas Log*.

By J. D. KILLOUGH

*United Gas Pipe Line Co.,
Shreveport, La.*

Since 107% of Weymouth's formula was expected (See Figure II), the five valve-to-valve sections involved were cleaned in the period from June 29 through July 13, and one remaining unsatisfactory section was again cleaned on August 22. Although very little foreign matter was removed, the capacity for an identical volume of gas was increased to 106.7% of Weymouth's formula.

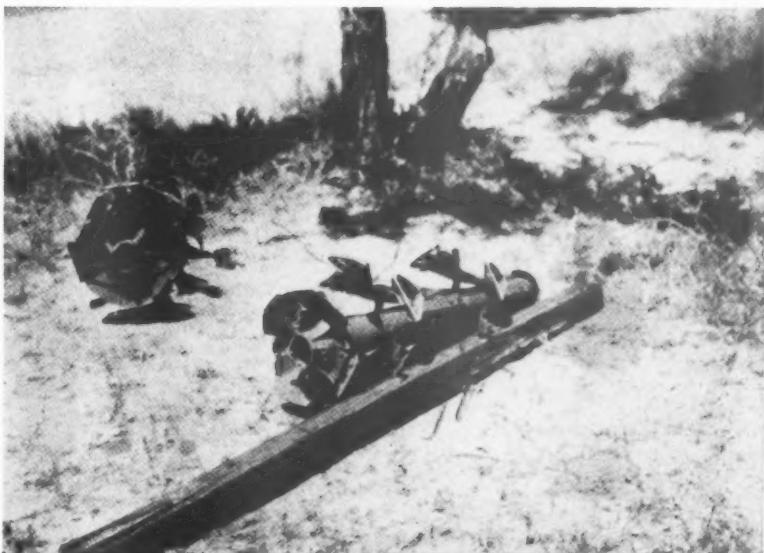
The 13.45 miles of parallel piping required for an 11% increase would call for 1,500 tons of steel. The actual expense of the cleaning operation, including all items such as labor, transportation, materials, and gas used in operations, came to \$6,881.85.

Three years ago the Refugio to Edna 16-inch line was operating at

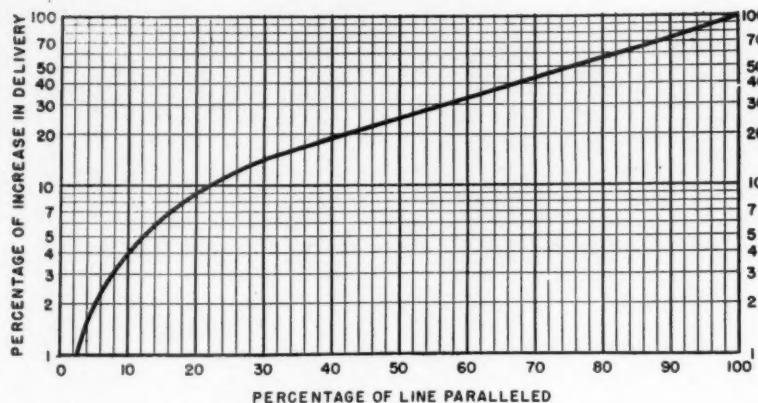
80% of Weymouth's formula. The removal of the gummy oil-rust deposits present in this section has furnished the greatest problem and the least satisfactory results up to the present time. The 35 miles of line which has been cleaned has now been sufficiently cleared to permit the usual practice of running from gate valve to gate valve in one operation; and while our last report shows only 93% of Weymouth's formula, this represents a 16% increase.

Capacity of the 37-mile Refugio to Pettus 18-inch line has been increased from 83% to 99%, while cleaning of 71 miles of the Pettus to New Braunfels 16-inch line has resulted in an increase of from 97% to 110%.

To date 142 miles of 14, 18, and 20-inch line from Bruni to San Antonio have been cleaned. The improvement on the portion from Orange Grove to Pettus was from 103% to



While cleaning the Pettus-Converse 16-inch line in the San Antonio district the go-devil came out of the pipe riding a skid which had probably been in the pipe line since it was constructed



Relationship between percentage increase in the delivery and percentage of the original line paralleled with pipe of the same size.

Figure 1

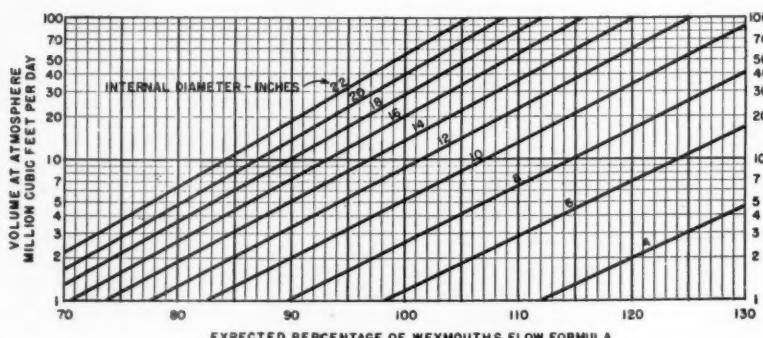


Figure 2

UNITED GAS SYSTEM SCRAPER OPERATIONS TO DATE OF LAST REPORTS AVAILABLE

December 8, 1943

Year	Number of Runs	Mileage Run	Mileage Cleaned	Mileage Cleaned 1st Time
1940	20	32	8	8
1941	86	281	116	110
1942	90	315	132	118
1943 (partial)	243	1375	563	411
Total	439	2003	819	647

District

Baton Rouge	—	—	—	—
Beaumont	—	—	—	—
Beeville	—	—	—	—
Dallas	2	3	2	2
Houston	127	406	128	84
Jackson	13	134	52	52
Monroe	16	102	51	51
San Antonio	192	1024	430	347
Shreveport	49	100	41	25
Southwest Louisiana	40	234	115	86
Wichita Falls	—	—	—	—

113%, and from Pettus to San Antonio from 99% to 103%.

Cleaning 35 miles of the Sarepta-Sterlington 18- and 20-inch line has resulted in an increase from 86% to 94%, and the Sugar Creek 10-inch line showed a gain from 85% to 105%.

The removal of 463 barrels of water and solids in 1942 and an additional 85 barrels in 1943 while cleaning 54 miles of 12- and 14-inch line from Call Junction to Iowa has shown the greatest improvement obtained. The section from Iowa to Lake Charles increased from 54% to 109%; the portion from Lake Charles to the De-Ridder Tap and on to Call Junction was raised from 64% to well over 100%.

In general, this work has been accompanied by a continuous improvement in the cooperation between the pipe line crews, the dispatchers, well attendants, compressor station employees, measurement men and all of the personnel involved.

Experience and organization have developed better methods and equipment which have shortened the time required on each job. The work is now planned in conjunction with regular maintenance work which calls for a shut-down, such as the removal of split-sleeves and the replacement of bad pipe and couplings.

A means for raising pipe line performance to expected levels has been established, emphasizing the necessity for a better method of obtaining accurate, continuous information on the performance of our various lines.

Recording pressure gauges have been installed at selected locations to furnish additional data which, when combined with that previously available, will permit efficiency calculations at desired intervals.

Periods of steady flow suitable for this purpose which are often difficult to secure over a limited period of time may be observed as they occur in normal operations, and checks repeated periodically will furnish a progressive comparison. This will result in a reduction in the time and travel formerly required to install and remove temporary equipment and will furnish a more uniform and accurate method of determining the need for further cleaning operations.

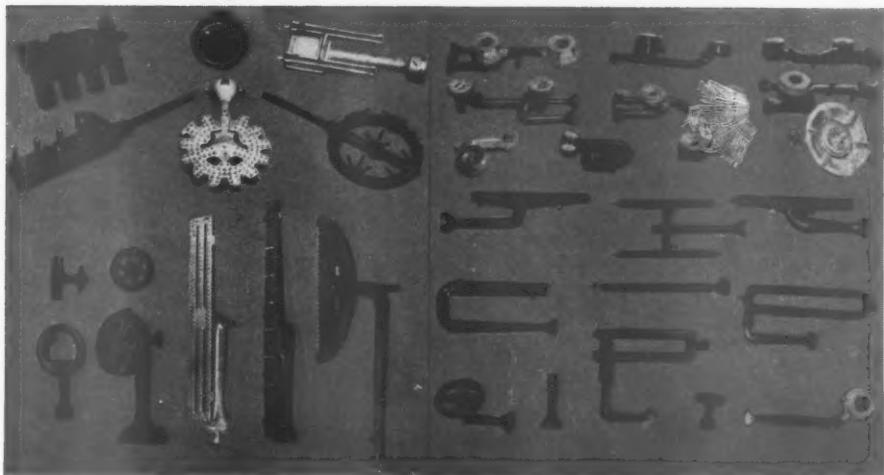


Figure 1—Contemporary atmospheric gas burners

Burner Research... *The Technique of Advancing Atmospheric Gas Burner Design*

ATMOSPHERIC gas burners are an essential part of every domestic gas appliance as well as many commercial and industrial appliances. They vary in size from a single port pilot burner a fraction of an inch in diameter and consuming little more than 100 B.t.u. per hour to multiport burners several feet long and consuming tens of thousands of B.t.u. per hour. They are made in nearly every conceivable shape fitted to the particular heating job to be done. A few contemporary models of different sizes and types are shown in Fig. 1. They perform efficiently such varied tasks as top burner cooking, broiling, baking, water heating, central and space heating, refrigeration, ironing, clothes drying, summer air conditioning and many others. Improvements in burners have either preceded or kept pace with every new gas appliance development.

Research on atmospheric gas burners has accordingly represented a major portion of assignments made by the American Gas Association Committee on Domestic Gas Research to its Lab-

By F. E. VANDAVEER

Assistant Director, American Gas Association Testing Laboratories

oratories from the time its program of fundamental research was undertaken. The first publication on this subject was issued as Bulletin No. 10, Research in Fundamentals of Atmospheric Gas Burner Design, in 1940. Bulletin No. 13, Fundamentals of Design of Atmospheric Gas Burner Ports, followed in 1942. Bulletin No. 16, Relation of Burner Volume to Ignition and Extinction Characteristics of Gas Range Top Burners, was published in 1943 while Bulletin No. 20, Gas Burners Utilizing All Air for Combustion as Primary Air, the fourth of the series, is just off the press.

Other research projects on burners are being diligently studied with results to be published at a later date, some of which are well advanced. They include:

1. Further investigation of 100 per cent primary air burners.
2. Mixing tube design.
3. Control of primary air with and without air shutters.

4. Small tubular burners with combustion taking place inside the tube.
5. Burners utilizing no primary air, producing non-luminous short blue flames.
6. Principles for designing improved luminous flame domestic burners.

In all of this work the primary objective has been to establish fundamentals of burner design which may be most generally and widely useful to designers, engineers and manufacturers of gas appliances. In some of the more difficult projects, it will be necessary to test out the theories developed by making preliminary models of burners. Also correlation of work on various parts of a burner, such as on ports and mixing tubes, will be necessary before a finished product can be evolved. Nevertheless with fundamentals of burner design set forth, they may be usefully applied to the many thousands of types of burners being designed and manufactured. It is essential, however, if the gas industry is to secure the greatest benefit, that men and women capable of reading and understanding these fundamentals and applying them in designing burners and appliances be em-

Presented at American Gas Association Technical Conference on Domestic Gas Research, Cleveland, Ohio, February 17-18, 1944.

ployed and encouraged by appliance manufacturers.

The technique of advancing gas burner design is not confined to any single agency. Notable contributions have been made by the Bureau of Standards, appliance manufacturers, and others. A particularly effective method has been the gradual raising of American Standard approval requirements with which over 95 per cent of all appliances sold in recent years have complied. Many manufacturers have made improvements in burner design in order to meet these standards.

Phases of the technique of advancing atmospheric gas burner design relating to burner ports, flame characteristics and mixing tubes will now be presented in order.

Burner Ports

Like other fundamentals of burner construction, many of those relating to burner ports are more or less generally recognized. It has been considered, for example, that flame characteristics are affected by the form of the port whether drilled, slotted, ribbon, raised, or flat; by port size, depth, spacing and number of rows; by burner heat temperature; and by air-gas mixture temperature. Different fuel gases may also require different treatment of ports. Until recently, information which will enable the designer to evaluate quantitatively all of these interrelated variables has not only been difficult to find, but in some instances, has not been available. Bulletin No. 13 provides such information. Based on thousands of tests and innumerable calculations, results are presented on port sizes ranging from No. 60 DMS to $\frac{1}{2}$ in. diameter, port depths of $\frac{3}{4}$ in. to less than $\frac{1}{16}$ in., raised port diameters from $\frac{5}{32}$ to $\frac{3}{8}$ in., raised port heights from 0 to $\frac{1}{2}$ in., port spacings from $\frac{1}{16}$ to 1 in.,

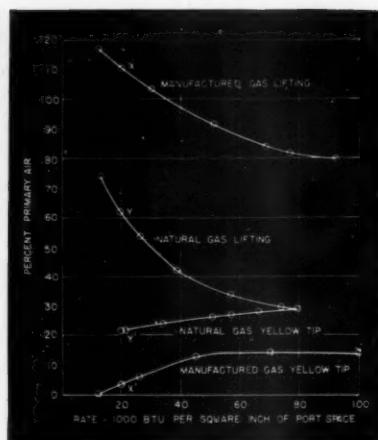


Figure 2—Typical lifting and yellow tip limit curves for manufactured and natural gas with No. 36 DMS ports

1 to 4 rows of ports and slotted and ribbon port forms. Where different fuel gases would have an influence on the results, three test gases were used ranging in heating value from 530 to 3200 B.t.u. per hour.

To measure limits of satisfactory burner port performance, two definite flame characteristics were used; namely, the lifting limit and the yellow tip limit. The lifting limit may be defined as that point at which the flame of a single port burner starts to leave the port or where several flames start to lift from a multiport burner. It is usually expressed in percentage of primary air at which lifting occurs for a given set of conditions. The yellow tip limit is that point at which a yellow tip appears in the flame or just disappears with change in primary air.

Lifting is a sign of too much primary air; appearance of yellow tips indicates too little primary air. Both are to be avoided in usual atmospheric burners. Typical curves are shown in Fig. 2 for natural and manufactured gas with No. 36 DMS ports. Good burner port design should fall well

above the yellow tip curves and below the lifting limit curves. For example, a burner designed for 20,000 B.t.u. per sq.in. of port area and No. 36 DMS ports would accommodate a primary air variation from 21 to 62 per cent for natural gas and from 4 to 110 per cent for manufactured gas between the yellow tip and lifting limits. These curves clearly illustrate the greater flexibility in operation of burners designed for 12,000 to 15,000 B.t.u. per hr. per sq.in. of port area for manufactured gas over those for higher inputs. Manufactured gas will give greater flexibility with inputs from 20,000 to 30,000 B.t.u. per hr. per sq.in. of port area. Values for a wide range of port sizes are given in Bulletin 13 so that the designer need only to refer to these curves to determine how his burner meets these essential conditions.

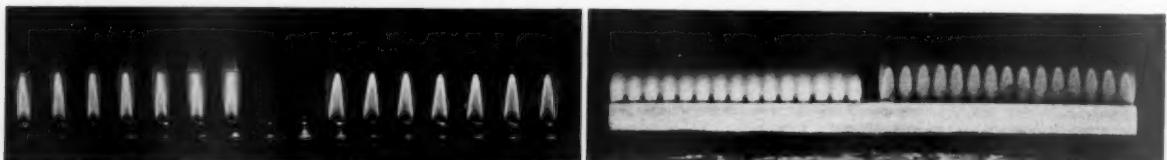
Other significant results set forth in Bulletin No. 13 include:

1. The larger the port size, the higher the percentage of primary air which can be accommodated before lifting flames are encountered whereas yellow tip formation is not appreciably affected by port size.
2. Increase in depth of port from $\frac{1}{16}$ in. to $\frac{1}{2}$ in. permitted higher percentage of primary air before lifting of flames occurred. Further increase in port depth had no appreciable effect. Depth of port did not influence the limit at which yellow tips appeared.
3. Neither variation in height nor diameter of raised port sections had any appreciable effect on lifting or yellow tip limits.
4. Distance between ports and increase in number of rows of ports had only a slight effect on lifting of flames. On spacings closer than $\frac{5}{16}$ in. (edge to edge of port) yellow tip elimination required increasingly greater percentage of primary air.
5. Ribbon ports will accommodate more primary air before lifting, but will also require more air to dispel yellow tips than normal size drilled port burners. To illustrate, on natural gas with No. 46 DMS ports at 15,000 B.t.u. per hr.

Figure 4—Photograph showing that inner cone flame height is unaffected by port size. No. 36 DMS ports at left; No. 26 DMS ports at right. Same gas rate and same primary air.

Figure 5—(right) Illustrating that primary air has no appreciable

effect on height of the outer mantle of a flame. Left and right halves of burner were adjusted at the same gas rate but with high percentage of primary air at left and low percentage at right. Outer mantle heights are equal



- per sq.in., primary air could be varied from 11 to 65 per cent between yellow tip and lifting limits whereas on similar sized slots it could be varied between 50 and 83 per cent.
6. Slotted ports of a width equal to the diameter of drilled ports will operate satisfactorily at both higher lifting and yellow tip limits than the drilled ports. In this respect, a slotted port of a width equal to No. 56 DMS drill compares favorably with a No. 26 DMS drilled port.
 7. Flow of gas-air mixture through burner ports can now be calculated more accurately than previously as a result of development of a new equation:

$$\text{New } Q = 1658.5 K \left(\frac{P}{d} \right)^n$$

$$(\text{Old } Q = 1658.5 K \sqrt{\frac{P}{d}})$$

Where: Q = air-gas flow in ft. per hr. per unit of port area

1658.5 = conversion factor to put all terms on equal basis

K = coefficient of burner port discharge

p = burner head pressure, in. of water

d = specific gravity of air-gas mixture (air = 1)

n = slope of line as plotted in Fig. 62, Bulletin No. 13

Flame Characteristics

In the successful design of a new burner and its application in an appliance, it is essential that characteristics of the resultant flame be known. The flame height of both inner cone and outer mantle must be closely estimated in order to avoid flame impingement on heating surfaces to such an extent that incomplete combustion may result. Tendency of flames of many types of fuel gases to lift from the ports should be so thoroughly known that this condition will not be obtained with resulting incomplete combustion and slow ignition. Possibilities for appearance of yellow tips must be accurately predicted so that ample primary air can be provided and deposition of carbon and incomplete combustion can be avoided. Flash-back of flame with resultant undesirable production of unburned gases and dam-

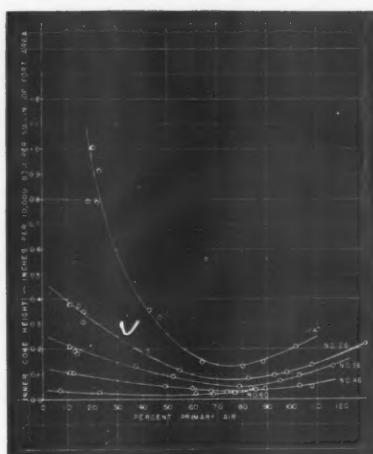


Figure 3—Relation of inner cone heights to per cent primary air (manufactured gas)

age to burner cannot be tolerated. As a result of publication of data in Bulletins Nos. 10 and 13, these flame characteristics for a given burner can be predicted. In the preceding section on burner ports, two other flame characteristics; namely, lifting and yellow tipping for many variations in burner design as well as for a few of the most widely used fuel gases were discussed and need not be repeated. Other interesting and important advances relate to flame height and flashback characteristics.

1. Height of Inner Cone

After measurements of inner cone height had been made for a large number of conditions on manufactured, natural and butane gases, it was possible to plot height in inches per 10,000 B.t.u. per hr. per sq.in. of port area against per cent primary air for those gases and for different port sizes. Other factors such as port spacing and port depth have a slight effect on inner cone height but not to such an extent that they need be considered. One series of such curves on manufactured gas is shown in Fig. 3 for port sizes from No. 60 DMS to $\frac{1}{4}$ in. It will be observed that inner cone height for a No. 60 port did not vary appreciably with primary air variation, whereas the $\frac{1}{4}$ in. diameter port caused a decrease in flame height from 1.0 to .13 in. with 20 to 77 per cent variation in

primary air. Minimum spread in inner cone height occurred at 77 per cent primary air. Above 80 per cent primary air, inner cone flame height increased slightly for each port size above No. 60. It will be noted that these curves have a similar pattern to inverted ignition velocity curves. Inner cone height is directly related to inner cone surface which is used as one method of determining ignition velocity of gases. Since maximum ignition velocity for the type of manufactured gas used is between 80 and 90 per cent primary air and above these percentages ignition velocity decreases, it would be expected that inner cone height could increase at higher percentages of primary air.

Another interesting comparison of inner cone flame height is shown in Fig. 4 wherein for a given rate per port inner cone flame height is unaffected by port size.

It was possible from the data obtained to develop the following mathematical equation, thus providing gas burner designers for the first time with a rapid means of calculating inner cone height of a new burner:

$$h = K a R$$

where: h = height of inner cone, in.

a = area of port, sq.in.

K = constant depending on primary air and fuel

R = gas rate, in 10,000 B.t.u. per hr. per sq.in. of port area

2. Height of Outer Mantle of Flame

Measurement of height of the outer mantle of a flame is not as precise as for the inner cone, as this mantle is not stable, is affected by air currents and has a tendency to flicker as yellow tips are approached. By making a good average outer mantle height measurement, reasonably consistent results were obtained.

Typical curves of outer mantle flame height with natural gas are shown in Fig. 8. Manufactured and butane gas give similar curves with different values for flame height. These curves show clearly that as port size is increased flame height is materially increased for a given gas input per unit of port area. It was also found that there is an appreciable increase in flame height from manufactured to natural to butane gas. This is charted in Bulletin No. 13. Furthermore, for all practical purposes, outer mantle height is independent of primary aeration for port sizes of No. 26 DMS and smaller. This is illustrated in Fig. 5. It is also shown in Fig. 6 that outer mantle flame height for two rows of ports is twice that for a single row. In

Figure 6—Illustrating that outer mantle flame height on two rows of ports at right is twice the height of flames on single row of ports at left

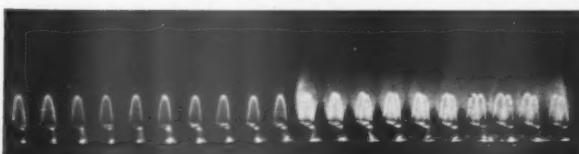


Figure 7—Illustrating effect of port spacing on outer mantle flame height. Port spacing increased from 0.05 in. at left to 0.5 in. at right



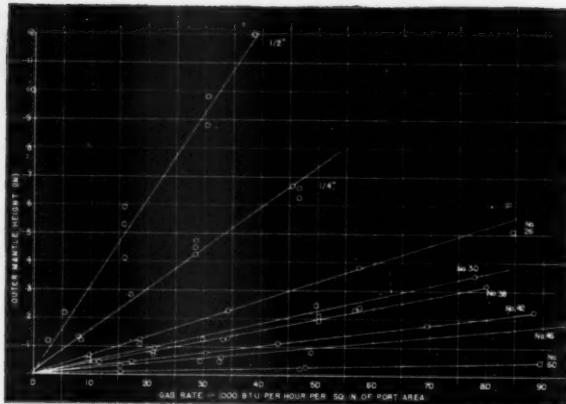


Figure 8—Height of outer mantle of flame on natural gas for various input rating and port sizes

Fig. 7 the effect of port spacing on outer mantle height is shown. Flame height greatly increased as port spacing was decreased from 0.5 in. to .05 in.

Based on the voluminous data obtained, it was found that height of the outer mantle of flame followed the empirical relationship:

$$h_0 = \frac{S a R}{\sqrt{d}}$$

where: h_o = outer mantle height in in.

$S =$ constant for all port sizes, No. 26 DMS and smaller and for different percentages of primary air with a given port spacing and fuel gas.

spacing and fuel gas
 a = area of a single port, sq.in.
 R = gas rate, in 10,000 B.t.u./hr./sq.in. of port area
 d = diameter of port in in.

d = diameter of port in in.

Thus it is possible from this equation and data supplied in Bulletin No. 13 to calculate in advance the height of the outer flame mantle of a projected burner. This is not only a great scientific achievement but will have much practical application in design of gas burners.

3. Flash-back

Flame will flash back through a port when the velocity of air-gas mixture flow through it is reduced below speed of flame propagation at any point in the flame surface. Tendency to flash back varies with type of fuel gas, port size, port depth, primary air, gas input rating, and temperature of ports as well as air-gas mixture. Flash-back may also be caused by excessive down draft on the flame.

A leaking manual or automatic burner valve permitting a small gas flow which is insufficient to maintain combustion at burner ports is one of the most serious hazards in causing flash-back. In burner operation, flash-back is to be avoided at all times. Most undesirable results of flash-back are the generation of products of incomplete combustion, sootting or clogging of interior of burners and orifices, and damage due to overheating of burners.

Propensity of flames to flash-back is di-

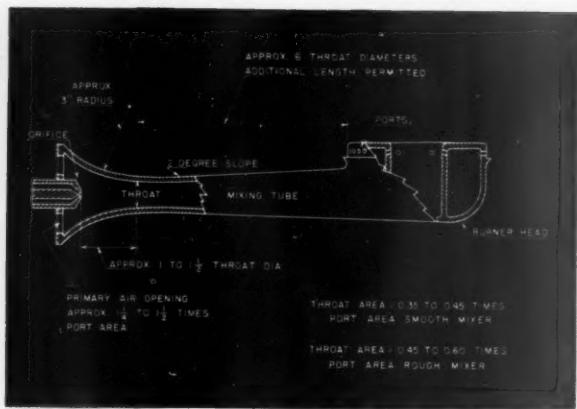


Figure 9—Generally accepted principles of design of atmospheric gas burners

rectly proportional to ignition velocity of fuel gases; the greater the ignition velocity the great the tendency to flash back. Therefore, gases high in hydrogen and carbon monoxide (the manufactured gases) will have far greater flash-back tendencies than hydrocarbon gases such as natural or liquefied petroleum gases. Flash-back tendencies also vary with percentages of primary air supplied, generally increasing as the primary air is increased.

Whether the material from which ports are formed is a good conductor of heat (metals) or resistant to heat flow (ceramics) also seems to affect flash-back, tendency being less pronounced for ceramic materials than for metals.

With drilled ports, flash-back may be controlled by using the proper size and depth of port. These factors are interrelated. The deeper the port up to approximately $\frac{3}{8}$ in. the larger the size that may be used without danger of flames flashing through it. Flash-back is first realized near the edge of the port since the mixture velocity at that point is considerably less than the average velocity through it. For this reason, poor drilling off center of a raised port section causing one edge of the port to be much more shallow than the rest, or an out-of-round port, will provide a point of decreased velocity and a source for flames to flash through the port. In smaller ports there may be less variation in mixture velocity across the port and apparently flames have a lesser tendency to flash back for this reason.

Flash-back occurs at higher gas input ratings for larger ports and over a wider range of primary aeration. A No. 36 DMS port is considered the largest size that may be used to avoid difficulty from flash back with a fast-burning manufactured gas. On some manufactured gases a No. 38 port or smaller is preferred. On natural gas considerably larger ports, No. 30-32, may be used without danger of flash-back.

Mixing Tubes

Maximum gas burning capacity of a burner depends to a large extent

on primary air injection and satisfactory performance can be obtained only when the gas input rate and primary air injecting ability of a burner are properly correlated. The primary air injecting power of a burner is dependent on several factors including the fuel gas used, the design of the mixing tube, relation of mixing tube to gas orifice, burner head temperatures, and combustion chamber pressure.

Ability of different fuel gases to inject primary air when supplied to a burner at the same input rate is theoretically directly proportional to the square root of the product of the specific gravity and the pressure at which each is supplied and inversely propor-

(Continued on page 139)

Determining Gasoline Content of Natural Gas

THE American Gas Association and the Natural Gasoline Association of America have published Code 101-43 containing revised A. G. A.-N. G. A. A. Standard Compression and Charcoal Tests for Determining the Natural Gasoline Content of Natural Gas. It brings up-to-date Code 101 issued in 1932 and effective January 1, 1933 under the title "Testing Natural Gas to Determine the Natural Gasoline Content Thereof."

In the ten years since Code 101 was issued certain modifications and refinements of the test methods became common practice in field testing. Therefore before issuing the revised Code 101-43, all practical suggestions for revision of tests to improve their accuracy and duplicability were considered by the committees and comprehensive field tests were conducted. The result of these studies is presented in Code 101-43.

Improving Installation Design and Reducing Investment Costs of Gas Air Conditioning



G. E. May

Unquestionably, one of the factors affecting the small extent to which air conditioning has been accepted for residential use is its relatively high investment and operating costs. It is no secret that design engineers seldom strained their imagination in thinking of means for reducing capacity requirements. The results, in too many cases, were loss of business from unnecessarily high costs and poor performance.

The first result is obvious, since there exists a nearly straight line relationship between capacity and cost. The second can easily be understood by recognizing the fact that dehumidification takes place only as long as the unit cycles "on." Larger capacity units cycle "on" for shorter periods resulting in ragged temperature regulation and inadequate humidity reduction. (The latter remark applies only to systems in which dehumidification is incidental to the cooling cycle, and does not apply to those systems with independent control over humidity, such as Electrodryer, Kathabar and Silica Gel.)

The A.S.H. & V.E. "guide" contains all the data necessary for calculating load requirements. However, the proper application of these data demands good judgment, and can easily represent the difference between an unnecessarily costly job lost to competition and a good job won by engineering skill. It seems, therefore, that a discussion of this phase of the cooling load analysis is very well worthwhile.

In treating this subject, it will be

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assumed that the reader is familiar with conventional, well accepted methods of calculating capacity requirements and the various sources of heat encountered. Each source of heat will be discussed in its usual order, showing ways and means by which a job may be more accurately estimated, and capacity requirements reduced without sacrifice in quality.

By G. E. MAY*

Chairman, Technical
Advisory Committee

Joint Committee on Gas Summer Air
Conditioning of the Industrial &
Commercial and Residential Sections,
American Gas Association

ences, but also the amount of wall and ceiling affected. This is particularly prominent in cases of high ceilings where conditioned air can be "puddled" into only half the room volume. Temperature of room is usually measured and set at breathing line. It must be recognized that the floor temperature will always be a few degrees cooler and the ceiling temperature a few degrees warmer. Stratification helps in non-ventilated attics where there exists a cooler film of air, relatively undisturbed, near ceiling of floor below. If the average attic temperature is 120°, this film is nearer 115° F. Therefore, in calculating transmission for a ceiling exposed to a non-ventilated attic, 120°-80° is over designing by 25%. 115°-85° is the nearer correct temperature differential.

Insulation is usually a good investment. Its advantages go far beyond economic consideration. It improves temperature control and air distribution. Its economic advantages are enjoyed throughout both winter and summer seasons. The use of insulation in walls is advisable in new construction but questionable in old. There is sound justification for ceiling insulation. In cases of finished attics the insulation should be installed between rafters. In ordinary unused attics it is better economically and thermally to insulate spaces between ceiling joists. The thickness of the insulation is subject to argument, although there is very little difference between 2" and 4", since the principle component of installed cost is the item of labor. Every one agrees that \$100.00 worth of insulation will save a ton of refrigeration, having an installed cost of at least \$300.00, and in addition saves operating expenses throughout the year.

Year round use of storm sash has been found of value in northern climates since it reduces the heat trans-

Heat Transmission Through Walls, Ceilings, and Floors

"K" factor for all materials is determined at Pittsburgh under atmospheric conditions which are more favorable than often found in the field. Care must be exercised in making corrections in K for hygroscopic material used in highly humid atmospheres. Extent of correction must be determined locally by experience.

Only maximum simultaneous loads must be determined. The inexperienced engineer often uses peaks which are not concurrent. Reference to local study of daily hourly temperature will indicate that heat transmission during morning hours is less than for evening hours, and may assist engineer in establishing simultaneous peak. In cases of walls, ceiling, and glass it is proper to use heat transmission or solar radiation, whichever is the greater,—not both. The latter includes effect of conduction so that in using both, as is often done, the engineer badly over-designs.

Stratification of conditioned air controls the amount of heat lost or gained through transmission, not only because of temperature differ-

fer through windows to less than half. This same practice should be considered in the south. Like insulation, it is a good investment and provides the same advantage of temperature regulation and air distribution. Systems in buildings so equipped are easier to balance and they remain in adjustment through all seasons.

Sun Effect

In order to properly analyze this heat source, latitude and orientation must be carefully considered. The angle that the sun strikes the building faces aids in selection of time-angle-solar values given in the A.S.H.V.E. "Guide." Full advantage should be taken of shade trees and the time of day its effect is felt. The color of the wall should be considered. White walls only absorb 20% of the sun's energy. Gray walls absorb 40%, red brick color about 60% and dark green 80%. Credit should be taken for lighter color surfaces.

Consideration of wall "lag" is important in deciding time of maximum simultaneous load. Many walls have a lag of 8 hours or more, with sun load being felt long after other loads are reduced.

Window coverings are important in controlling amount of sun heat to be handled. In addition to the coverings mentioned in the "Guide" many new and attractive types have recently been introduced, having very high shading qualities. Some of these are sold under trade name of "Cool-shade," "Clearview," etc.

Electric Lights and Appliances

A study of the time and nature of use of this heat source will determine whether it is concurrent with other peak loads, and the extent to which it is in use at time of peak. To consider 100% of light and appliance load 2-3 P.M. would result in over design since, at this time of day, natural daylight is adequate in many areas.

Where lights and appliances are used on peak hours, the generated heat can be reduced appreciably by isolation. In most cases exhaust fans are required to remove the outside air introduced through the air conditioning system. These fans can

often be arranged to exhaust outside air requirements through luminaries or hoods over heat and vapor generating appliances. 30-50% heat resistance from these units is not uncommon. The rule of thumb is that heat, vapors, and odors cannot travel against an air velocity in excess of 50 feet per minute. This same technique is advantageously applied in isolating bathrooms, lavatories, kitchens, etc.

The possibilities in reducing heat from these sources become evident when consideration is given to the working and living habits of the occupants.

Persons

Errors in capacity often result from improper evaluation of number of persons within conditioned areas. An attempt is made to estimate the average maximum number of people to be handled, which is frequently high. The engineer is really concerned with the number of persons expressed by the formulae: Number

$$\frac{\text{Persons} \times \text{Minutes Exposed}}{60}$$

In addition, he should determine the diversity in distribution of these people, since they all are not in the same zone at the same time. Further he determines this only for the hour of simultaneous peak on system, for obviously the number of persons may be greater for hours when other component loads are substantially lighter.

Ventilation

In this item, the engineer is faced with the problem of what he gets rather than what he wants. The great majority of estimates of infiltration are inadequate. Unfortunately, there are no determined correction factors. They must be developed in each territory for each type of construction, and for local conditions of wind, temperature, and humidity. The unknown value of infiltration has effected discrepancies in estimates of sensible and principally latent loads. The determination of the latent component has often been so inaccurate that the system cannot meet guaranteed requirements. In fact, few systems would be paid for if contract guarantee was rigidly enforced.

Much can be done to correct this situation and at the same time reduce the capacity needed for a good job. First of all, the family habits should be studied to determine what doors are most frequently used. These doors should be provided with automatic closing devices and well weather stripped. Other openings which should be weather stripped are: all windows exposed to wind; doors leading to outside and to unconditioned areas; doors leading to bathrooms and especially those used by servants.

Weather stripping, like insulation, pays its way. It reduces capacity requirements and system cost. It makes possible the maintenance of lower wet bulb temperature, and effects a more uniform distribution of temperature.

Duct Losses

Ducts must frequently be run through unconditioned areas where thermal losses occur if no protection is used. It is considered profitable to insulate such ducts externally with 1" to 4" blanket, depending on surrounding temperature.

Where acoustic treatment is required, it may be substituted for external insulation, as there is no economy in using both.

Totals—Still High

The addition of all of these items represent a total of many reduced maximum simultaneous loads. This total suggests a larger plant than may be necessary, depending upon load factors which may be applied.

Load Factor

By definition, Load Factor is the ratio of the actual required load to the estimated load.

Load factor is the result of the thermal storage capacity of all the walls, ceiling, floor furniture, etc. It has the effect of a flywheel in clipping off peaks of short duration. It is affected by the thermal lag in the construction shell and load diversities other than those treated in calculation of requirements. The effect is similar to the charging and discharging of a storage battery.

Load factor varies with the type of

construction, its thermal capacity, and lag. It varies with the *hours of use* of the system, day, night—both. The load factor on a given structure is lower for 24 hour operation than for 10 hour service.

Load factor varies the *nature of use*,—the type and periods of peaks. It varies with the *nature of the load*,—internal loads do not favor good load factor while external loads do.

Some interesting studies along these lines were conducted in New Orleans during summer of 1941. Two types of construction were

studied for 10 and 24 hour operation. One was a single story, light constructed frame house, and the other was a two story medium heavy masonry home.

The following data were taken under identical operating conditions:

No.	House	Operating Hrs. Per Day	Percent	Gas Usage Percent	Load Factor
1.	Light	10	100%	—	1.
2.	Light	24	240%	—	.88
3.	Heavy	10	100%	100	.9
4.	Heavy	24	240%	160	.725

Electronic Holiday Detector Provides Robot Pipe Inspection Service

By D. E. STEARNS

United Gas Pipe Line Co.,
Shreveport, La.



D. E. Stearns

PIPE line coatings and methods of application have been improved in recent years so as to give a better job, or to result in a better job more quickly, but in spite of improvements in material and coating machine, faults such as coke inclusions, skips, large bare areas, etc., have continued to occur during application. These spots or areas of low electrical resistance, commonly called holidays, in a coating otherwise having high dielectric strength, are obviously objectionable. They may be thought of as parasites which feed even more rapidly on the steel at those unprotected spots or areas than would be the case at those same locations were the pipe entirely bare.

Progressive builders carefully guard against extensive holidays even if electrical protection is to be installed as a part of the initial construction program.

The device used for locating coating faults during construction has come to be generally known as the "holiday detector"—consisting simply of some type of high voltage generator together with appurtenances of a more or less conveniently portable nature. In common use for some time, such equipment is intended to produce sufficient disturbance by sparking at holidays to attract the attention of the operator for marking and subsequent repair. However, due to the light of day and noise on the job, the indication made by sparking is easily overlooked if not accompanied

by positive evidence as by an audible alarm.

The new Electronic Holiday Detector provides, along with other important improvements, such an audible alarm, and is designed for rapid, thorough and dependable coating inspection service heretofore unavailable until its advent. The assembly weighs approximately 120 pounds and consists of the following parts: (1) The Instrument—containing the Voltage Generator, Bell Alarm, Panel Light Indicators, Register and automatic controls; (2) Wet Cell Storage Battery; (3) Carriage of cast aluminum with resilient rollers and insulated handles; (4) Rotor assembly, attached to the end of the Carriage, used to propel the Exploring Electrode; (5) Exploring Electrode composed of spring wire close

wound with connectors at respective ends adapted to be conveniently engaged and disengaged; (6) Trailing Ground Cable.

The detector is rolled along the top of the pipe line—being handled efficiently by two unskilled men, (1)—The Operator, who attends to the single manual control and pushes the machine—acting as observer on one side of the line, and (2)—The Helper, who acts as observer on the opposite side of the line.

Since the detector travels on the pipe it not only is moved along the right-of-way with ease under virtually all conditions, but also administers uniform inspection irrespective of terrain. It performs its function equally well in a swamp or across water as though it were being used under normal conditions.

Several hundred miles of facilities have been inspected satisfactorily in The Gulf South with the Electronic Holiday Detector.



Running the holiday detector over 16-inch pipe in the Gulfport pipe yard preparatory to laying a loop in the Lirette-Mobile line

Appliance Servicing . . . a Postwar Plan for Turning a Liability into an Asset



G. A. Parker

placed upon both. A list of these factors on both sides follows:

Advantages to Customers

1. Complete service instead of "spot" adjustment.
2. More freedom in asking for service.

Our Home Service Department reports that many people continue to use poorly regulated appliances rather than ask for free service.

3. Confidence in service received. From the days of the old "free" advertisements, many of which had a definite catch in them, a



- well-founded belief has grown up that "you get what you pay for."
- 4. Longer life for appliances. This has a definite economic value to the customer.
- 5. Greater efficiency in fuel use. Here again, greater efficiency due

IN undertaking to plan a service-to-customer set-up, it was first necessary for us to consider advantages of a charge service plan both to customer and company, against requirements

By G. A. PARKER
*Jersey Central Power & Light Co.,
Asbury Park, N. J.*

- to good service means reduced cost per operation to the customer. This does not necessarily mean a lower gas bill as we have long known that customers will make more use of a satisfactory appliance than they will of an unsatisfactory one.
6. Less failure in appliance operation with consequent saving. The war has brought a realization of the importance of avoiding food waste and spoilage such as never existed before in this country.

Advantages to Company

1. Income instead of expense. We are able to prove this item from actual experience.
2. Satisfaction of allied interests.
3. Time and opportunity to give better and more complete service.
4. Better customer satisfaction.
5. Elimination of "nuisance" calls. By nuisance calls we mean those which come as chronic complaints from customers who frequently call for free service when service is not actually needed or when it is needed because of negligence on the part of the customer. In our own experience with charge service we found these calls reduced to a minimum.
6. Place greater value on warranties and guaranties. (Only the best class of appliance carries these.)
7. Educational program (in long run) will be of great value.
8. Pride of service employees in being an asset instead of a liability. We found that servicemen who knew that the customer was paying for the work which they did were inclined to do much more

careful work than they had done under a free service policy.

9. Greater value in customer's mind. In return for these advantages the customer is required to pay for value received. Some of them certainly will feel for a time that they are now paying for something for which they formerly paid nothing; but in our experience the type of service which we



are able to give under a "Charge Plan" is so much superior to the necessarily limited free service that it soon offsets in the customer's mind, any feeling of unfairness.

Education Necessary

The company, of course, was required to sell the "Charge" to the public; to sell employees on the necessity for charging; and to educate all employees who had any part in handling complaints. This education in itself proved a valuable asset.

It is apparent that the advantages from all points of view far overbalance the requirements. We should like to call attention at this point to the fact that these factors, as listed, are the direct result of actual research

and experience over a period of some months.

In April of 1942, we put into effect a plan substantially like the one which follows. This was continued until the OPA put us back to pre-war service. During those months we had a few headaches and we learned some valuable lessons. On the whole, however, the operation was so successful that we hope to return to it as soon as possible.

Savings Reported

To quote from a report made to the president of our company: "The account of Service on Consumer Premises, commonly termed free work on consumer premises, indicates that for the first three months of this year (1942) as compared to the similar period last year, we showed an increase of \$1054.84, while for the three months this year, following the introduction of the plan, as compared to the three months last year, we show a saving of \$6405.17."

Following is the resultant plan which we laid out for a new start. It is divided into four major headings. They are: Organization, Charges and Costs, Public Contacts, and Overall Cooperation. The ex-



pansion of these four headings represents a simple outline of what we believe would be a profitable, workable program, satisfactory to our customers and ourselves.

Charges and Costs

1. Which Services shall be charge and which free?

We will charge for all service on consumer's side of meter, except such services as are covered by guarantee or warranty, sponsored by our Company. House heating service is also excepted from charge.

(Note: Safety factor service necessity is recognized and covered under another sub-heading. See: Collections.)

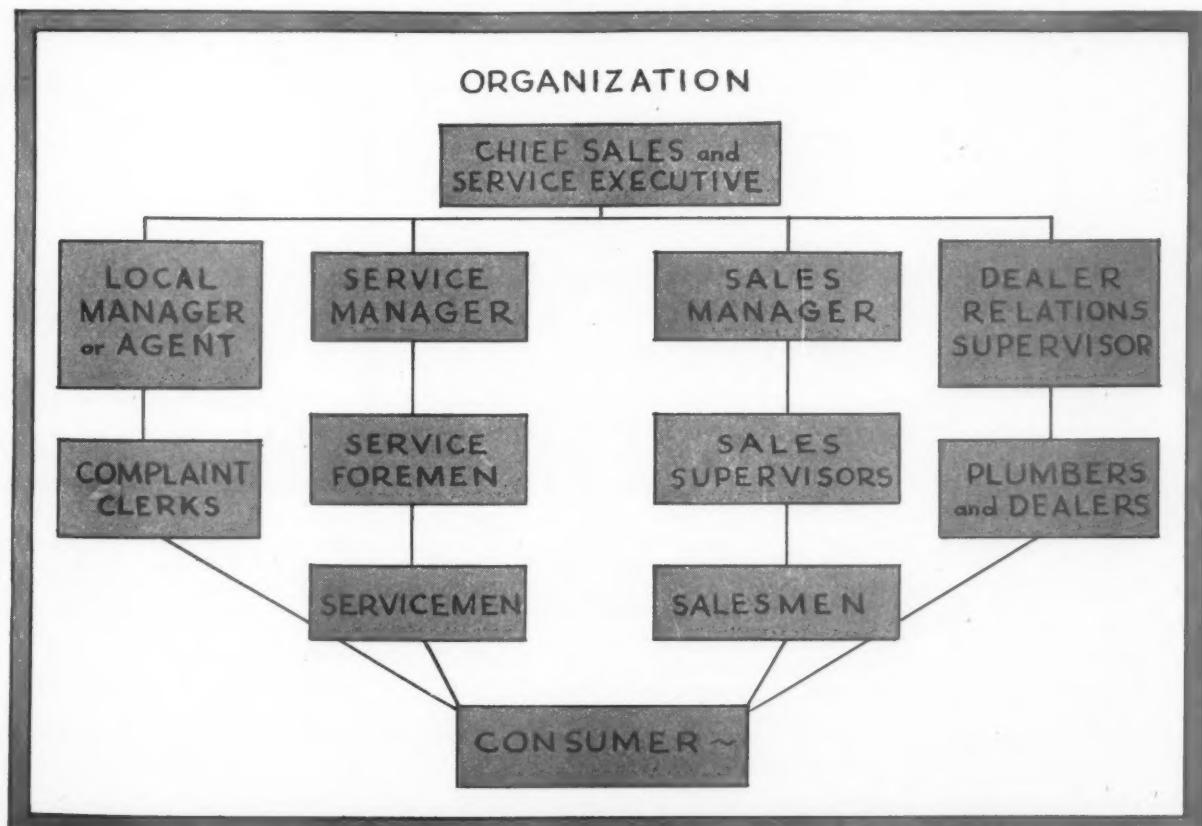
2. On what basis shall service charges be figured?

All service charges shall be figured on a cost plus basis for both parts and labor. Parts charges shall be figured at factory cost plus 100% except on parts under a term warranty in which case warranty charges shall be used. (i.e. Electrolux replacement units out of warranty period; some types of water heater tanks, etc.) Labor shall be charged on a flat per hour, per man basis, based on cost to company for type and time of work. A labor charge minimum shall be established to cover up to first hour of time charged.

3. What collection policy shall we follow?

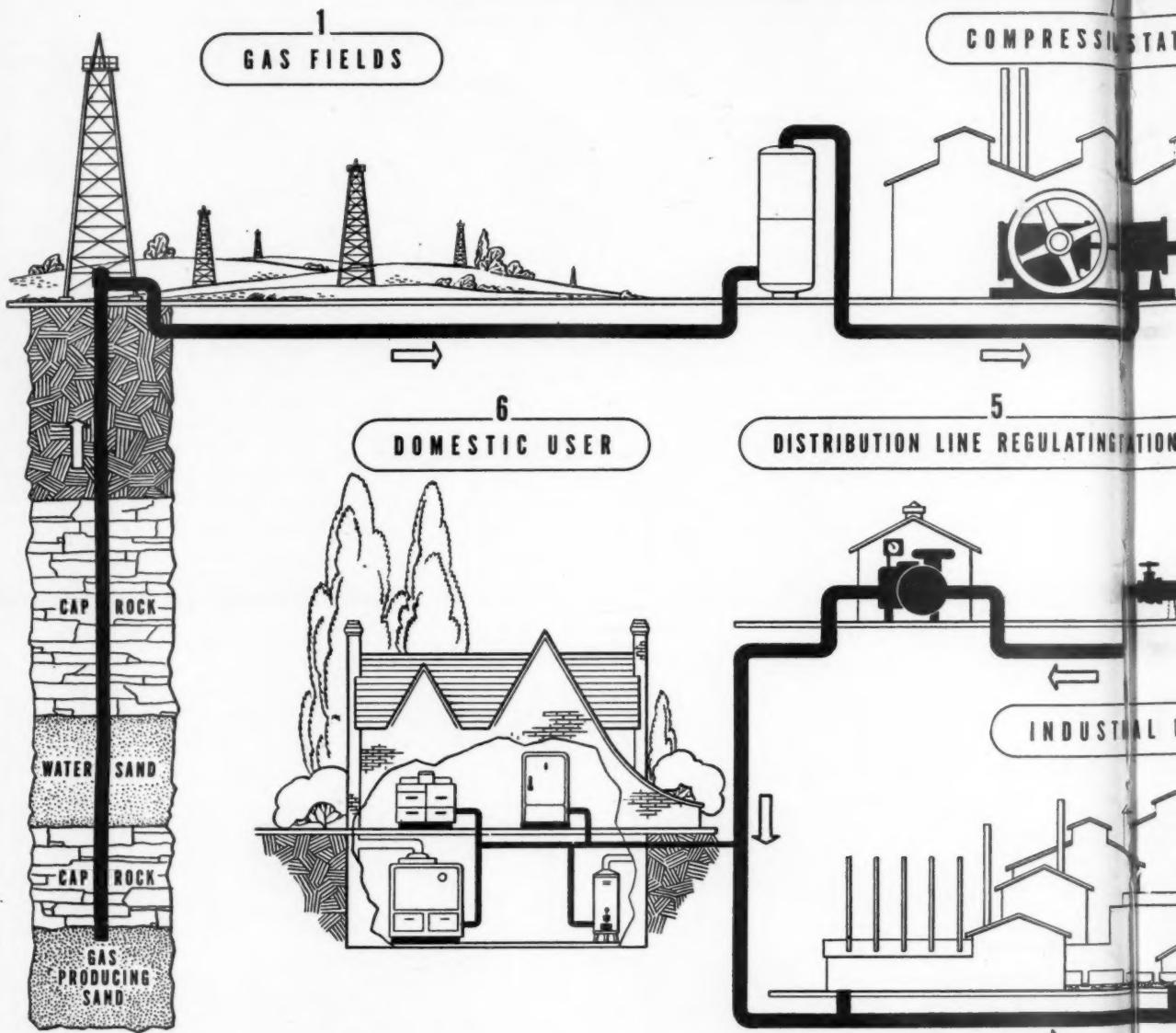
Each complaint order shall carry a statement for consumer's signature agreeing to pay for parts used, if any, and labor

(Continued on page 140)



NATURAL GAS FIRM

EQUITABLE GAS COMPANY PITTSBURGH DISTRICT



1. Natural gas is found in gas producing sands at an average depth of one-half mile below the earth's surface in Pennsylvania, West Virginia and Kentucky. Geologists have determined that there are sufficient owned or leased areas of gas reserves to supply the anticipated requirements of the Equitable Gas Company's customers for many, many years to come.
2. At suitable locations in the Company's transmission system huge compressing stations take the gas at low pressures, compress it to high pressures to force it through the lines to the Pittsburgh district. Some of the gas requires but one such compression; gas from other locations may be compressed as many as five times before reaching the city.

3. Natural gas is stored in natural storage areas underground at locations convenient to the Pittsburgh district. It is released, as needed, to maintain the supply to the Company's customers during periods of exceptionally high demand. These areas are actually gas producing sands from which the gas had been previously exhausted, and into which natural gas from the transmission system is now forced with special compressors.
4. Prior to entering the Pittsburgh district, the high pressure, required to transport this natural fuel from the gas fields, undergoes its first step of reduction and regulation.
5. On the other side of the Pittsburgh district, the gas passes through another regulating station.
6. Finally, the gas reaches the customer.

F E M W E L L T O U S E R

PAN PITTSBURGH, PENNSYLVANIA

ISSUE STATION

REGULATION

INDUSTRIAL USER

TRANSMISSION LINE REGULATING STATION

REPRESSURING STATION FOR GAS STORAGE

COMMERCIAL USER

5. Numerous smaller regulating stations at carefully planned locations in the distribution system further regulate the pressure which assures successful operation of gas equipment and appliances. For that reason customers of the Equitable Gas Company enjoy exceptionally uniform pressures.

6. Here we appreciate gas the most, because it is the ideal fuel for carefree and modern househeating, refrigeration, water heating and cooking. Because of its cleanliness, economy, convenience, and dependability, more and more people are using Gas for the 4 Big Jobs.

7. Natural Gas is a fuel refined by nature, and its use in more and more industrial processes is constantly growing day by day to help meet the increasingly rigid requirements of today's quality products. Manufacturing plants use natural gas in widely varying applications—from the tiniest brazing torch to the largest steel melting furnace.

8. Natural gas is the all-purpose fuel in commercial establishments. It provides quick heat and clean heat, so necessary for automatic space heating, water heating, cooking, refrigeration, and the many heat-using operations found in commercial shops, institutions, schools, professional offices, garages, cleaning plants and many other establishments.

Hartford Gas Sponsors Architects' and Builders' Meeting



Messrs. Crane, Alder and Goldman conducting building forum

ARCHITECTS, builders, bankers, representatives of governmental and civic organizations, and the press gathered at the Hartford Gas Company building on Thursday evening, January 20, to attend an Architects' and Builders' Meeting, sponsored by the gas company.

N. B. Bertolle, president of the company, opened the meeting by welcoming those present and discussing the importance of the building industry and the allied trades to the local community. A group of nationally known executives in the architectural and building professions addressed the meeting, including J. S. Crane, vice-president of *American Builder & Building Age*; George W. Alder, technical director of Good Housekeeping Institute, and A. S. Goldman, associate editor of the *Architectural Forum*.

Mr. Crane discussed postwar building from the angle of scope, price range of postwar homes and type of construction, giving a vivid picture of what the future will hold. He stated his belief that the postwar home will be higher in cost than homes constructed in 1940 but that this higher cost will not affect sales as the home will be equipped with more efficient units than ever before. He stressed the fact that the women of America will demand the

latest and most modern home equipment and that builders must construct homes to meet this demand.

Mr. Alder discussed the lack of adequate housing facilities in the prewar era and stated that the correction of this situation will be one of the first postwar objectives. He reviewed the progress made in the development and utilization of new products and materials for the postwar home, and emphasized that liveability and equipment will be important factors in home planning after the war. He suggested that architects and builders should give much thought to more efficient kitchen planning, improvements in home equipment, and a study of safety factors such as stairway railings and the elimination of slippery floors.

Mr. Goldman delivered an address entitled "Selling the Second Half Million Houses" and pointed out that builders and mortgage bankers must recognize that the public expects the ultimate in new-home construction after the war. He reviewed the results of a recent national survey which indicated that 13.3% of the families of the nation plan to buy new homes at the end of the war, which would set up a potential market of 4,700,000 houses, a large part of which demand is from the

low-income groups. He agreed with the other speakers that the postwar home must, of necessity, be a complete house, fully equipped, with a predictable cost of operation, and financed under a single-payment long-term mortgage plan. Mr. Goldman visualized such a home as having the necessary equipment to provide automatic heat, automatic hot water, and quality facilities for cooking, food preservation, storage, laundry equipment, garbage disposal unit, and other such appliances.

Following the individual addresses, Messrs. Crane, Goldman and Alder joined in a forum and answered questions from the audience regarding architecture, building, finance, and other pertinent subjects.

This meeting aroused much interest and enthusiasm among those present, and H. R. Carlson, sales manager of the Hartford Gas Company, in charge of the meeting arrangements, stated that similar meetings would be held from time to time in the near future.

Houston Natural Makes Rapid Progress



Frank C. Smith

COMMEMORATING a decade of progress since Frank C. Smith became president of Houston Natural Gas System, the company's magazine, "Burner Tips," brought to light the following interesting facts:

"Ten years ago there were approximately 750 miles of pipe line in the Houston Natural Gas System. Today that total exceeds more than 1,500 miles or twice the number at the time Mr. Smith became president.

"Ten years ago the company was providing gas service to fewer than 50 communities. Today, Houston Natural has enlarged its distribution facilities until it serves more than 70 cities, towns and villages in a double tier of 20 counties along the Texas Gulf Coast.

"Ten years ago there were 29,659 customers on Houston Natural's lines. The company's 66,853 accounts billed at the peak period of the present year thus reflect an increase of 125.4% over its connections at the beginning of the decade."

Mr. Smith is chairman of the board of trustees of The Institute of Gas Technology which he was instrumental in establishing. He is also president of the Southern Gas Association and active in the affairs of the American Gas Association. Recently he was re-appointed by Governor Coke Stevenson as a member of the board of trustees of the Texas College of Arts and Industries, Kingsville, for a six-year term. He has been president of the board since Sept. 1, 1941.



Partial view of crowd attending Hartford builders' meeting

Job Classification Manual Available

THE Southern Personnel Conference group of the American Gas Association has published a manual of Gas Utilities Job Classifications, according to an announcement by Chairman C. H. Horne, Alabama Gas Company, Birmingham, Alabama. Prepared by a Committee on Job Classifications under the chairmanship of W. B. Collins, vice president, Peoples Water & Gas Company, Miami Beach, Florida, it represents a study of gas utility operations in the southern region of the United States.

The manual covers the functions, responsibilities, minimum training and experience required for replacements under wartime emergency conditions, and the physical requirements for 84 job classifications found in all departments of gas utilities' operations. It is for use in connection with Manning Tables, Replacement Schedules, Selective Service requirements and similar uses.

The books are bound and are available from the American Gas Association, 420 Lexington Avenue, New York 17, N. Y., at a cost of \$1.00 per copy. A similar manual covering Natural Gas Distribution Job Classifications, prepared by the Southwest Personnel Conference group, is also available at the same price.

Gas in Rumania

(*The Gas World*, January 1, 1944)

THE great raid on the Rumanian oil fields at Ploesti must have succeeded because quite suddenly there has been a demand for oil saving. In Bucharest and other cities, oil is often used for heating, but according to the Sudost Economics, an Hungarian publication, great changes are being made in Rumania. These include the change-over of boilers from oil to solid fuel or gas. The laying of more gas pipeline in Bucharest where, it is reported, 13.7 kilometers of line have already been laid. The Bucharest power station has had to be re-equipped to take natural gas instead of oil and in southern Transylvania gas pipelines are being laid in every conceivable corner.

Philadelphia Electric Wins Award

THE National Security Award, highest honor within the gift of the Office of Civilian Defense, has been awarded the Philadelphia Electric Company. Formal presentation to H. P. Liversidge, president of the company, was made by Colonel Henry A. Reninger, acting regional director of OCD, at an impressive ceremony in the Broadwood Hotel, Philadelphia, on February 1.

The award "signifies extraordinary achievement in establishing superior security and

protection measures against enemy air raids, fire, sabotage and avoidable accidents," Colonel Reninger stated.

Philadelphia Electric employees "by voluntary enrollment and training as members of the United States Citizens Defense Corps," he said, "have evidenced their patriotic zeal in the creation of an efficient organization for the total protection of your facility. The award indicates a fine

spirit of cooperation of management and employees beyond the call of routine duty."

John S. Wood, emergency defense coordinator of the company's volunteer defense corps, was appointed on December 15, 1941—eight days after Pearl Harbor. Of the approximately 7,000 employees in the company, 4,933 are enrolled as volunteers and 3,374 have received special training in defense technique.

The Kind of Gas Range Pittsburgh Dealers Say Women Want

DIMENSIONS

Width—40"

Overall height without light—44"

Height of back panel
—8"

Oven size—14" high
19" deep
16" wide

FEATURES

Low oven

Side oven

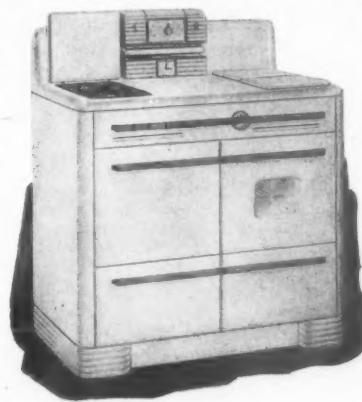
High broiler—drawer type

Divided top

4 Burners

Automatic top burner lighting

Automatic oven lighting



Giant burner
Simmer burners
Drawer type storage
Flush to wall construction
Round corners in oven
All white
Drawers on roller bearings
Oven window
One piece top

ACCESSORIES AND EQUIPMENT

Top light
Burner covers
Condiment sets
Deep well cooker
Oven clock control
Timers
Oven light

dicated complete satisfaction with present average sized ovens, 14" x 19" x 16", and voted for a side location rather than one in the center of the range. A surprising number of dealers are opposed to oven door windows and the vote was unexpectedly close.

High broilers are overwhelming favorites with the drawer type having a slight edge over swingouts. Four burners are apparently enough for the average range with the divided top arrangements preferred. The standard cluster top also remains popular.

An eight-inch high back panel was first choice by a small margin over six-inch panels and ranges apparently must have top lights, burner covers, condiment sets and time reminders. Giant burners and simmer burners were also unanimous choices as were flush to wall design and automatic top burner lighting. Drawer-type storage space was favored over door type and postwar ranges will have round corners in the oven if the survey results are followed.

A majority of dealers are impressed with the possibility of deep well cookers. The same holds true for all-white ranges as only a minority favor the white and black models.

Automatic oven lighting, an old friend of dealers in the Pittsburgh area, was favored by an almost 2 to 1 vote and oven clock controls, little heard of in that area, were a more than 2 to 1 favorite.

NEW MEMBERS OF THE A. G. A.

GAS COMPANIES

	<i>Delegates</i>
Kansas-Nebraska Gas Fuel Co., Lexington, Nebr.	F. P. Dicus
Richmond Gas Corporation, Richmond, Indiana	E. E. Linburg

MANUFACTURER COMPANIES

The American Rolling Mill Co., Middletown, Ohio	R. C. Beam
Pennsylvania Range Boiler Co., Philadelphia, Pa.	E. B. Kaufman

INDIVIDUAL MEMBERS

Jerrold Q. Abel	Southern Counties Gas Co., Los Angeles 14, Calif.
F. J. Arnberg	Coast Counties Gas & Electric Co., Yreka, Calif.
Walter T. Baxter	Majestic Manufacturing Co., St. Louis 3, Mo.
C. C. Becker	Southern California Gas Co., Los Angeles 54, Calif.
A. J. Beckham	United Gas Corporation, Huntsville, Texas
Walter C. Blanchard	Citizens Gas Fuel Company, Adrian, Mich.
Robert W. Blanks	Colorado Interstate Gas Co., Colorado Springs, Colo.
Herbert L. Bohon	Tappan Stove Company, Kirkwood, Mo.
F. E. Bowes	United Gas Corporation, Biloxi, Miss.
Edward C. Bradfield	The Bridgeport Gas Light Co., Bridgeport 1, Conn.
C. L. Brockschmidt	Office of War Utilities, Washington, D. C.
Almer H. Brodeck	American Stove Co., St. Louis 10, Mo.
P. J. Brown	The East Ohio Gas Co., Kent, Ohio
Edgar J. Buckingham	Southern Counties Gas Co., Los Angeles 14, Calif.
Harry W. Burlingame	The Baxter Springs Gas Co., Bartlesville, Okla.
E. M. Cannon	United Gas Corporation, Lake Charles, La.
Harold A. Cannon	Diebold Incorporated, Canton 2, Ohio
Richard K. Cartlidge	The Chicago Corporation, Chicago 3, Ill.
P. H. Chaffin	United Gas Corporation, Opelousas, La.
C. W. Charles	Southern Counties Gas Co., San Luis Obispo, Calif.
E. L. Cheever	Southern Counties Gas Co., El Monte, Calif.
H. P. Clark	Coast Counties Gas & Electric Co., Arcata, Calif.
Jeannette Clifton	Dept. Public Utilities, Richmond, Va.
R. S. Collings	United Gas Corporation, New Iberia, La.
A. R. Combs	Southern Counties Gas Co., Los Angeles 14, Calif.
Thomas Creigh, Jr.	Kansas-Nebraska Natural Gas Company, Inc., Phillipsburg, Kan.
W. B. Currey	United Gas Corporation, Nacogdoches, Texas
George E. Curtis	Boston Consolidated Gas Co., Boston, Mass.
R. K. Dallas	Central Illinois Light Co., Peoria 2, Ill.
Bill Dalton	Arkansas Western Gas Co., Fayetteville, Ark.
F. E. Dennard	United Gas Corporation, McComb, Miss.
L. P. Derrick	Southern California Gas Co., Los Angeles 54, Calif.
J. C. Dezelle	United Gas Corporation, Schulenburg, Texas
Frank W. Duvels	Southern California Gas Co., Los Angeles 54, Calif.
J. J. Duggan	Walsh Refractories Corp., St. Louis 7, Mo.
M. P. Duke	Duke Manufacturing Co., St. Louis 6, Mo.
Dorothy E. Duncan	Southern Counties Gas Co., Santa Maria, Calif.
Leon E. Ellison	Southern Counties Gas Co., Los Angeles 14, Calif.
H. M. Evans	Fluor Corporation Ltd., San Marino 9, Calif.
Phil B. Ezell	United Gas Corporation, Houston 1, Texas
Robert E. Finnin	Boston Consolidated Gas Co., Boston, Mass.
Marjorie L. Fischer	Southern Counties Gas Co., Pomona, Calif.
R. N. Franklin	United Gas Corporation, Sinton, Texas
C. E. Funston	Southern Counties Gas Co., Ventura, Calif.
Ralph F. Gibson	Tide Water Power Co., Wilmington, North Carolina
R. O. Glascott	The East Ohio Gas Company, Cleveland 14, Ohio
David F. Gould	The Barrett Div., Allied Chemical & Dye Corp., Phila., Pa.
James P. Grady	Public Service Electric & Gas Co., Hackensack, N. J.
Clayton D. Grover	Whitehead Metal Products Company Inc., New York, 14, N. Y.
Mrs. Mary N. Hall	Elizabethtown Consolidated Gas Co., Elizabeth, N. J.
B. H. Harper	Northern Natural Gas Company, Omaha 1, Nebr.
R. S. Harvey	Pacific Lighting Corporation, Los Angeles 26, Calif.
	Herman C. Heink
	F. L. Henry
	Arnold J. Herrmann
	American Cast Iron Pipe Company, Kansas City 6, Mo.
	Southern Counties Gas Company, Ventura, Calif.
	Southern Counties Gas Company, Santa Ana, Calif.
	Southern California Gas Company, Visalia, Calif.
	Pacific Lighting Corporation, Los Angeles 26, Calif.
	Southern Counties Gas Company, El Monte, Calif.
	Southern California Gas Company, Los Angeles 54, Calif.
	United Gas Corporation, Beaumont, Texas
	Southern Counties Gas Company, Oxnard, Calif.
	Public Service Electric & Gas Co., Newark, N. J.
	Southern Counties Gas Company, Laguna Beach, Calif.
	Majestic Manufacturing Company, St. Louis 3, Mo.
	United Gas Corporation, Marshall, Texas
	Southern Counties Gas Company, Los Angeles 14, Calif.
	Southern Counties Gas Company, Santa Ana, Calif.
	Hudson Valley Fuel Corporation, Troy, N. Y.
	Southern California Gas Company, Pasadena 6, Calif.
	General Electric Company, Bloomfield, N. J.
	Haverhill Gas Light Company, Haverhill, Mass.
	Coast Counties Gas & Electric Co., Dunsماuir, Calif.
	United Gas Corporation, Laurel, Miss.
	City of Leicester Gas Department, Leicester, England
	Coast Counties Gas & Electric Co., Pittsburg, Calif.
	United Gas Corporation, Jacksonville, Texas
	The Bridgeport Gas Light Company, Bridgeport, Conn.
	Boston Consolidated Gas Company, Boston, Mass.
	Southern Counties Gas Company, Santa Maria, Calif.
	Southern Counties Gas Company, Los Angeles 14, Calif.
	Southern Counties Gas Company, Ventura, Calif.
	Southern California Gas Company, San Bernardino, Calif.
	Savannah Gas Company, Savannah, Georgia
	United Gas Corporation, Monroe, Louisiana
	Southern California Gas Company, Visalia, Calif.
	The Brooklyn Union Gas Company, Brooklyn 2, N. Y.
	The Bridgeport Gas Light Company, Bridgeport 1, Conn.
	Southern Counties Gas Company, Santa Monica, Calif.
	Southern Counties Gas Company, Santa Barbara, Calif.
	Southern Counties Gas Company, Los Angeles 14, Calif.
	Southern Counties Gas Company, Santa Ana, Calif.
	Southern California Gas Company, Los Angeles 54, Calif.
	Southern California Gas Company, Los Angeles 54, Calif.
	Southern Counties Gas Company, Ventura, Calif.
	United Gas Corporation, Mineola, Texas
	David Stout & Sons, Webster Groves, Missouri
	Pacific Lighting Corporation, Los Angeles 14, Calif.
	Southern Counties Gas Company, Ventura, Calif.
	Boston Consolidated Gas Company, Everett, Mass.
	United Gas Corporation, New Braunfels, Texas
	Liverpool Gas Company, Liverpool, England
	Southern California Gas Company, Los Angeles 54, Calif.
	Point Pleasant, New Jersey
	The East Ohio Gas Company, Cleveland 14, Ohio
	Southern California Gas Company, Los Angeles 54, Calif.
	Southern Counties Gas Company, Santa Monica, Calif.
	The Brooklyn Union Gas Company, Brooklyn 2, N. Y.
	Pacific States Cast Iron Pipe Company, Los Angeles 13, Calif.
	Northern Natural Gas Company, Omaha 1, Nebr.
	Southern California Gas Company, Rialto, Calif.
	The Laclede Gas Light Company, St. Louis 8, Mo.

New Book on Safety Engineering

A TIMELY new book, "Applied Safety Engineering," by H. H. Berman and H. W. McCrone, outlining a practicable tested method of dealing with accidents as cases has just been published by McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 18, N. Y. Mr. Berman is safety engineer for the Consolidated Gas Electric Light and Power Company of Baltimore and is past chairman of the Accident

Prevention Committee of the American Gas Association. Mr. McCrone is field engineer for the Baltimore Safety Council.

In the book, each accident case is analyzed and carried through various successive steps to discover the corrective measures needed to prevent recurrence of similar accidents or near-accidents. It sets forth and discusses in detail nine main duties of a safety engineer and then describes the kind of individual required for the job.

The authors have made no attempt to provide an exhaustive treatise on industrial safety engineering, and have purposely lim-

ited their discussion to a few phases of activity which they consider to be most important in safety engineering but which seem to be most difficult to put into practical operation.

Contents include chapters on "How to Make Investigations," "Investigation Reports on Cases," "How to Write Safety Rules and Regulations," "How to Write Safety Messages," "How to Hold Safety Conferences," "How to Make a Safety Talk," and "How to Make a Safety Inspection." An appendix states the facts of 25 additional and different accident cases and suggest possible ways of using them.



Members of the Research and Coordinating Committee of the Interstate Oil Compact Commission. Left to right, back row: Samuel F. Peterson of Illinois; P. J. Hoffmaster, representing F. R. Frye of Michigan; J. B. Wilson, assistant technical secretary of the committee; Dan O. Howard of Oklahoma; E. G. Dahlgren, technical secretary of the committee; and F. M. Van Tuyl of Colorado. Front row: Hiram M. Dow, representing John M. Kelly of New Mexico; L. L. Jordan of Arkansas; Joseph L. McHugh, representing H. W. Bell of Louisiana; Jack K. Baumel of Texas; and L. B. Taylor, chairman of the committee, of Kansas.

Important Natural Gas Studies Completed by Interstate Compact Research Group

THE Research and Coordinating Committee of the Interstate Oil Compact Commission is now in its third year of existence since its organization in December, 1941.

Upon its organization, the committee, composed of technicians on the staffs of state regulatory agencies of associated organizations, agreed upon its activities which called for an exchange of information among members based on data which were being collected by the various state conservation agencies.

In January, 1942, the committee employed E. G. Dahlgren as its technical secretary to serve as a coordinator in collecting and assembling technical and statistical information. In April, 1942, J. B. Wilson was employed as assistant technical secretary.

In 1942 the committee made surveys by states of secondary recovery, pressure maintenance, natural gas, and stripper wells. During 1943 it made surveys by states of stripper wells, natural gas underground storage projects, and the administration of oil and gas conservation laws.

At the December, 1943 quarterly meeting in Wichita, Kansas, the committee agreed to bring up-to-date the national stripper well survey in cooperation with the National Stripper Well Association. It is hoped that the survey will be completed for release at the spring quarterly meeting at New Orleans on April 3-4.

The committee also agreed to bring up-to-date the survey of underground natural gas storage projects. It is now engaged in a study of methods of taking bottom hole pressure measurements and gas-oil ratios. This project, in cooperation with the Regulatory Practices Committee, is part of an overall project to apply uniform engineering definitions and standardized techniques to the statutes recommended by the Legal Committee.

One phase of this overall project was a study of dual and multiple completions in the various states. It is hoped that a report on this subject will be released at the New Orleans meeting.

The program of cooperation with the Petroleum and Natural Gas Division of the U. S. Bureau of Mines in collecting samples of crude for oil analysis from pools in the member states of the Compact

is being continued. During 1943 to December first, 93 samples were collected and analyzed. At the request of the Bureau of Mines, the committee is continuing this cooperative program during 1944 as samples of crude from new fields and 500 gallon samples from certain areas are desired.

At the request of the Petroleum Economics Division of the Bureau of Mines, the committee assembled data pertinent to natural gas production and utilization during 1942 for their states to be included with the information in the annual Natural Gas Chapter of the Bureau of Mines Minerals Yearbook.

Postwar Report on Gas Competition Published by A.G.A. Committee

THE second milestone in the work of the American Gas Association Postwar Planning Committee was passed recently with the publication of the first report of the Subcommittee on Competitive Factors Affecting the Realization of Potential Markets under the chairmanship of R. J. Rutherford, vice-president, Worcester Gas Light Company, Worcester, Mass. The initial report of the committee entitled "Postwar Purchasing Power and Potential Markets," C. V. Sorenson, chairman, was published last September.

Buttressed with a considerable number of charts, tables and other illustrations, this 57-page, 8½ x 11-inch printed report, contains data of great value to the gas industry. It consists of three major divisions with individual chairmen as follows: (1) Electric Competition, R. E. Ginna, Rochester Gas and Electric Corp.; (2) Other Fuel Industries, N. B. Bertolette, president, Hartford Gas Co.; and (3) Gas Appliance Merchandising and Sales Promotional Policy Trends, B. A. Seiple, Jersey Central Power and Light Company.

In considering the subject of electric competition, Mr. Ginna presents facts of

national significance, such as domestic electric and gas customer density, trend of use, installed electric capacity, and incremental cost to consumer of domestic gas and electric service, plus a specific illustration of gas and electric service in a modern residential subdivision. In addition, Mr. Ginna incorporates in his report a contribution of gas and electric engineers working independently to determine the incremental distribution investment for certain domestic gas and electric loads.

Significant data on the oil, coal and liquefied petroleum industries, with particular attention to reserves and competitive possibilities, are contained in Mr. Bertolette's division. It contains references to a large number of fuel authorities.

The final section of the report contains the results of a survey by Mr. Seiple's committee designed to record the merchandising and promotional policies of gas utilities and their relationship with dealers engaged in retailing the four major gas appliances. Information was obtained from 164 companies representing 15,497,459 meters or 82½ per cent of the country's total meters.

Personal AND OTHERWISE

Taber Named Atlanta Vice-President

ROCK GRANITE TABER has been operating vice-president of Atlanta Gas Light Company and Florida Public Utilities Company, according to announcement by H. Carl Wolf, president. His headquarters will be in Atlanta, Ga.

He succeeds E. J. Meade who resigned to become associated with the Texas Public Service Company of Austin, Texas.

Mr. Taber resigned as vice-president of Stone & Webster Service Corporation to accept the vice-presidency of the Georgia and Florida companies. He has been connected with Stone and Webster for the past 37 years in the various departments of engineering, construction, service and operations of public utilities.

Batten Elected President of Michigan Consolidated



John W. Batten

the company, a newly created office.

The demands of his duties as chairman and president of United Light & Power Company and its subsidiaries, including American Light & Traction Company, which holds all common stock of the Michigan Consolidated Gas Company, necessitated Mr. Woolfolk's retirement from the presidency of the local company.

Mr. Batten rose through the ranks to the presidency, having joined the company in 1906 immediately after his graduation from the University of Toronto as a chemist and mineralogist.

For the last six years he has been vice-president and general manager in charge of the Detroit district. He has been vice-president since 1926. Mr. Batten is a mem-

ber of the Executive Board of the American Gas Association and chairman of the important Committee on Industrial Gas Research.

Capt. Henry A. Fink was appointed general manager of the Detroit district to succeed Mr. Batten. A. V. McRee was elected secretary.

Adam Kurtz was re-elected vice-president and treasurer, and Henry Tuttle was retained as vice-president and controller.

Three new members named to the board of directors are Mr. Tuttle, Thomas K. Humphrey, Chicago, vice-president and general counsel of United Light & Power Company, and D. Dwight Douglas, president of the Chicago, Duluth & Georgian Bay Transit Company.

Organization Changes in Detroit

THE following changes in the organization of the operating divisions of the Detroit District of the Michigan Consolidated Gas Company were announced February 18 by Capt. Henry A. Fink, general manager:

T. W. Weigle, formerly staff assistant of the Michigan Consolidated Gas Company, Detroit District, is appointed gas engineer. He will be in general charge of all the technical matters connected with the supply of gas to the district, including experimental engineering activities, the laboratories and other special duties.

Frank J. Woolfenden, formerly superintendent of pressures, is appointed engineer of distribution design of the Detroit District. He will be in general charge of the work of designing transmission and distribution systems, betterment-of-supply projects and the making of pressure surveys. He will authorize the gas pressures to be carried throughout the systems, issue and authorize the procedure for pressure controls for pipe line construction and maintenance and will also be in charge of electrolysis control for the company.

Louis G. Kreuz, formerly superintendent of production, is appointed assistant to the general manager of the Detroit District. He will be in general charge of the operations of the production, stock, gas dispatching and main office building departments. Mr. Kreuz is chairman of The American Gas Association's Subcommittee on High B.T.U. Gas.

E. Buddrus Heads New Natural Gas Body

EBUDDRUS, president, Panhandle Eastern Pipe Line Co., Chicago, has been elected president of the Independent Natural Gas Association of America. Paul Kayser, El Paso Natural Gas Co., El Paso, Texas, has been named first vice-president and J. H. Dunn, Shamrock Oil & Gas Corp., Amarillo, second vice-president. Treasurer is F. W. Peters, Oklahoma Natural Gas Company.

An Executive Committee has been selected as follows: W. H. Wildes, president, Republic Natural Gas Co., Dallas; Joseph Bowes, president, Oklahoma Natural Gas Co., Tulsa; Mr. Kayser; D. D. Harrington, Hagy, Harrington, Marsh, Amarillo; and Mr. Buddrus.

Membership in the Association is open to all producers of natural gas, pipe line companies and owners of natural gas royalty interests. It will concentrate on problems of producers and royalty owners and represent its members before legislative and administrative bodies.

Hewson on Copy Group

HCARL WOLF, chairman of the Committee on National Advertising of the American Gas Association announces the appointment of W. B. Hewson, manager of publicity and advertising of The Brooklyn Union Gas Company, to the national advertising copy committee. This committee collaborates with advertising counsel in preparing the gas industry's national advertising program.

Champion Stove Designer



Joseph Becvar, Sr., 73-year-old director of the development department, Grand Home Appliance Co., Cleveland, points to the new compact gas range he designed without the use of substitute materials. He is pictured with Jean Law, and Tom Collins Haley, during his appearance as guest star on the popular "What's Cookin'" broadcast over Station WJW. In his fiftieth year as a stove designer, Mr. Becvar has designed 45 different models.

Gas Institute Adds to Its Staff

SIX appointments have been made to the staff of the Institute of Gas Technology at Illinois Institute of Technology, it has been announced by John I. Yellott, director of the Gas Institute.

These include Dr. Joseph D. Parent, research associate; Mrs. Elizabeth M. Rueck, assistant chemist; Shiro Mori, assistant chemist; E. A. Munyan, senior mechanical engineer; Doris Kariya, clerk, and Patricia Mack, draftsman.

Dr. Parent comes to the Gas Institute from Kansas State College, where he was associate professor of chemical engineering. Prior to that, he was assistant professor of chemistry at Loyola University, Chicago. As a research associate he will work in the chemical process development section of the Gas Institute laboratories.

Mrs. Rueck, chemistry graduate of the University of Chicago, is doing research work on the purification of gas for home consumers.

S.S. Allan C. Balch Launched

THE 317th vessel built by the California Shipbuilding Corp., the Liberty ship S.S. Allan C. Balch, was launched January 17. It was christened by Mrs. Alexander Macbeth, of South Pasadena, wife of the former president of the Southern California Gas Company and member of the board of directors of California Institute of Technology.

Allan C. Balch (1864-1943) was founder of the Southern California Gas Co. and the San Joaquin Light & Power Co.

Dr. Henderson, Noted Gas Expert, Dies

DR. YANDELL HENDERSON, an expert on gases and director of the Yale Laboratory of Applied Physiology, died in February. He was an authority on the physiology of respiration and circulation and on the pharmacology and toxicology of gases.

Dr. Henderson and his associate, Dr. Howard W. Haggard, are credited with introducing 25 years ago the method of revival from carbon monoxide poisoning and other forms of asphyxia which has since come into wide use and has been extended to the treatment of many other conditions. It consists of the inhalation of carbon dioxide diluted with air or oxygen.

In 1922, they invented but did not patent the "H & H Inhalator," which was first used by the rescue crew of the Consolidated Gas Company of New York under a grant of funds from the American Gas Association.

In 1920 Dr. Henderson, in collaboration

with Dr. Haggard and Dr. Raymond C. Coburn, introduced the use of carbon dioxide after anesthesias as a means of eliminating the anesthetic and preventing post-operative illness. This in turn resulted in the application of the inhalation to prevent massive collapse of the lungs and post-operative pneumonia.

Since 1928 the Henderson-Haggard technique was further developed to replace old and crude methods of stimulating the breathing of new-born infants, saving thousands of lives annually.

With Dr. Haggard, he devised the standard of ventilation for the Holland Tunnels under the Hudson River.

Miss Mary Spear Retires from Association Work



Miss Mary Spear

A VETERAN of Association service, Miss Mary Spear, until recently in charge of membership for the American Gas Association, retired on March 1. Miss Spear had completed more than 25 years' service with the Association and the former Natural Gas Association of America.

Known to more old-time natural gas men than probably any other person, Miss Spear had not missed a natural gas convention in her first 20 years in the industry. She joined the Natural Gas Association of America 25 years ago last July as librarian at its Pittsburgh headquarters. She became a part of the A. G. A. staff in 1927 at the time the natural gas organization merged with the A. G. A.

In recent years, she was proof reader for the A. G. A. MONTHLY and other Association publications and also assisted in the work of the Natural Gas Section.

Before entering gas association work, Miss Spear was employed as librarian in the Carnegie Library at Braddock, Pa., the first Carnegie Library in the United States. Later, she was in charge of the Carnegie Library at McKeesport, Pa.

Brooklyn Men Awarded McCarter Medals

FOUR employees of The Brooklyn Union Gas Company were honored recently for having performed outstanding acts of life saving by application of the Schafer prone pressure method of resuscitation. Three received McCarter medals and one a McCarter bar. The presentations were made at one of a series of year-end meetings paying tribute to exceptional achievement and long service in the industry.

McCarter medals were presented to Daniel W. Ande, customer service; John Kopp, Greenpoint Works; and Howard Willis, transportation division. Joseph M. Casey, Nassau office, previous winner of a McCarter medal, received a McCarter bar for again performing a heroic life-saving act.

The awards were made by the American Gas Association upon recommendation of the Accident Prevention Committee.

Heroic Chaplain Brother of Utility Employee

THE Brooklyn Borough Gas Company has a special interest in the colorful career of Father Stephan J. Meany, famous chaplain of the Fighting 69th (165th New York Infantry), because he is the brother of Marie Meany, purchasing agent for the Brooklyn utility.

Chaplain Meany was in the thick of action when the 165th landed on Makin Atoll in the Pacific. He was wounded in the right arm, the right shoulder and would have received a fatal wound in the right breast had a bullet not been deflected by a sacred medal on his chest. A story of the heroic action of the Chaplain and his comrades appeared in a number of articles in New York newspapers.

Awarded the Purple Heart, later the Silver Star, Chaplain Meany is now in the United States.

Mayer Elected

RAYMOND C. MAYER, of New York, well-known in the field of public relations in the gas industry, has been elected president of the National Association of Public Relations Counsel, Inc., it was announced February 1, following the annual meeting of the Association. The Association has chapters in various cities of the United States.

Through the years, Mr. Mayer's agency has served the Association of Gas Appliance and Equipment Manufacturers, the Gas Industries exhibit at the New York World's Fair and Servel, Inc.

How Gas Makes Bombers

ONE large aluminum company has recently installed approximately 5,000 radiant tubes in new aluminum furnaces in their various plants.

New England Gas Annual Meeting



N. B. Bertolette

THE program committee of the New England Gas Association, under the chairmanship of Edwin L. Hall, Manchester Gas Co., has prepared a strong program for the eighteenth annual business conference of the Association scheduled to take place March 23 at

the Hotel Statler, Boston. Because of war requirements the customary two-day meeting has been reduced to one day.

N. B. Bertolette, president of the Association and president, The Hartford Gas Company, will preside and deliver the President's Address at the first session, Thursday morning. Following the election of officers and directors and presentation of "The Year's Report" by Clark Belden, executive secretary of N.E.G.A., Colonel Willard F. Rockwell will talk on postwar developments from the manufacturers' viewpoint. Col. Rockwell is president of the Association of Gas Appliance & Equipment Manufacturers.

Another featured speaker at the morning session will be Ernest R. Acker, president, American Gas Association, whose topic will be "National Developments in the Gas Industry." A. M. Beebe, Rochester, chair-

man, A. G. A. Committee on Postwar Planning, will speak on "Mobilization for Postwar Action." The session will close with an address on "America's New Frontier" by Walter R. MacCormack, dean, Department of Architecture, Massachusetts Institute of Technology, and vice-president, The Institute of American Architects.

Attention at the second session, Thursday afternoon, will be centered on research. Everett J. Boothby, Washington, chairman, A. G. A. Committee on Domestic Gas Research, will open the program with an address on cooperative gas industry research. John I. Yellott, director, Institute of Gas Technology, will present facts about the Institute's research program.

The importance of the gas house heating load will be emphasized in a presentation by Henry O. Loebell, New York, chairman, A. G. A. Subcommittee on Economics of House Heating. Frederic O. Hess, president, The Selas Co., Philadelphia, will talk on the "Industrial Gas Outlook," and C. George Segeler, utilization engineer, American Gas Association, will present a gas industry analysis entitled "We'll Always Need Gas."

CONVENTION CALENDAR

1944

MARCH

- Mar. 6-7 Southern Safety Conference Atlanta, Ga.
 15-16 West Coast Technical Conference on Domestic Gas Research Ambassador Hotel, Los Angeles, Calif.
 22-23 Southern Gas Association Annual Meeting Roosevelt Hotel, New Orleans, La.
 23 New England Gas Association Annual Meeting Hotel Statler, Boston, Mass.
 30-31 1944 American Gas Association War Conference on Industrial and Commercial Gas Hotel Seneca, Rochester, N. Y.

APRIL

- Apr. 3-4 Interstate Oil Compact Commission, Quarterly Meeting Roosevelt Hotel, New Orleans, La.
 3-5 American Society of Mechanical Engineers Birmingham, Ala.
 5 Mid-West Gas Association Annual Meeting Des Moines, Iowa
 10-12 National Association of Corrosion Engineers Rice Hotel, Houston, Texas
 18-19 American Gas Association Distribution Conference Hotel Statler, Cleveland, Ohio
 19-20 Missouri Association of Public Utilities St. Louis, Mo.
 26-27 Gas and Electric Industry Accounting Conference Cleveland, Ohio

MAY

- May 1-4 U. S. Chamber of Commerce Waldorf Astoria Hotel, New York, N. Y.
 2 Pennsylvania Gas Association Annual Meeting Philadelphia, Pa.
 8-11 National Fire Protection Association Philadelphia, Pa.
 11-13 Natural Gas Spring Conference, American Gas Association French Lick Springs Hotel, French Lick, Ind.
 15-16 Indiana Gas Association Hotel Lincoln, Indianapolis
 15-18 Natural Metal Trades Association Hotel Biltmore, New York

JUNE

- June 6-7 American Gas Association Joint Production and Chemical Committee Conference Hotel Pennsylvania, New York, N. Y.
 6-8 Public Utilities Advertising Association Palmer House, Chicago
 6-8 Southwestern Gas Measurement Short Course University of Oklahoma, Norman, Okla.
 8 American Management Association Annual Meeting Hotel Pennsylvania, New York, N. Y.
 19-22 American Society of Mechanical Engineers Pittsburgh, Pa.

OCTOBER

- Oct. 3-5 National Safety Congress Sherman, Morrison & LaSalle Hotels, Chicago, Ill.

Indiana Gas Convention

THE 1944 convention of the Indiana Gas Association will be held at the Hotel Lincoln, Indianapolis, Monday and Tuesday, May 15 and 16. The program committee consists of Tom Kemp, Indianapolis, chairman; C. V. Sorenson, Hammond; and Ed Hahn, Kokomo.

A meeting of the board of directors will be held Sunday evening, May 14.

Oil Compact Meeting

DATES of the New Orleans quarterly meeting of the Interstate Oil Compact Commission have been changed to Monday and Tuesday, April 3 and 4. Headquarters will be at the Roosevelt Hotel where committee meetings and general sessions will be held.

Arthur J. McClellan Dies

ARTHUR J. McCLELLAN, superintendent of distribution for the Manufacturers Light and Heat Company and affiliated companies, died Jan. 30. He resided at 233 Hazel Drive, Mt. Lebanon, Pittsburgh.

Mr. McClellan had been associated with Manufacturers for 25 years, having been agent for the company in the South Hills for a number of years before being promoted to his latest position.

Mr. McClellan was a member of the American Gas Association and the Pennsylvania Natural Gas Men's Association.



Accounting SECTION

O. H. RITENOUR, Chairman
C. E. PACKMAN, Vice-Chairman
O W BREWER, Secretary

Simplification of Reports to Governmental Authorities

EARLY in 1943, representatives of the American Gas Association joined with representatives of the Edison Electric Institute in work which had been instigated, under the leadership of W. G. Bourne, Jr., directed to the simplification of or reduction in reports to governmental authorities. At that time, it was found that the electric companies, in connection with the reproduction of annual reports to governmental authorities, had obtained permission to submit annual reports to the Federal Power Commission and a number of State commissions by means of what has come to be known as the die-impressed stencil or mimeographed process. This method of duplicating reports was used by some 108 electric companies in 1943, with satisfactory results. The stencils are mechanically impressed with the text copy, and so designed for typing in the required annual report information; any desired number of copies may then be obtained by use of the standard mimeograph machine.

1943 Accomplishments

Throughout the year 1943, further efforts were made to expand this method of preparing and duplicating annual reports. A number of committees gave considerable time and effort to this phase of the work, including certain gas companies represented individually, and W. T. Neel's Committee on Financial and Accounting Questionnaires to Public Utilities, a Subcommittee of the Advisory Committee on Government Questionnaires, which is cooperating with the staff of the Division of Statistical Standards of the Bureau of the Budget. The Interstate Commerce Commission, Association of American Railroads, Federal Communications Commission, and others, are also giving consideration to the mimeographed method of duplicating reports.

The matter was also discussed with the Committee on Statistics and Accounts of the National Association of Railroad and Utilities Commissioners, at which time it was brought out that the form of the State reports differed only in minor aspect from that required by the Federal Power Commission, and that considerable time and effort could be saved if the State commissions would accept a duplicate of the Federal Power Commission Report. The committee appreciated

* Chairman, Committee on Simplification of Reports to Governmental Authorities.



Elmer K. Higley

By ELMER K. HIGLEY*

General Auditor, Middle West Service Company, Chicago, Illinois

the problems faced by the industry and has since recommended to the various State commissions that they accept, for those companies that are required to file reports with the Federal Power Commission, a stenciled duplicate of that report, expanded only for the insertion of certain supplementary sheets to meet the particular requirements of the respective states. This procedure would permit the full use of the stencil process. As far as the natural gas companies are concerned, permission to submit their annual report for the year 1943 by use of the die-impressed stencil process has been obtained from the Federal Power Commission.

A. B. Dick Company, of Chicago, Illinois, was approached, and agreed to prepare the necessary dies and handle the stencils. Those companies that are interested should communicate with this firm, who will be glad to explain the duplicating process in more detail, or to assist with respect to the problems facing any particular company. So far, no stencils have been prepared for the manufactured gas companies, as these companies are not required to file any report with the Federal Power Commission and have, as well, varying State requirements. A complete set of stencils is available, however, to

any natural gas company that is required to file F.P.C. Annual Report Form No. 2 (formerly F.P.C. No. 133), at a cost of approximately \$40, with anticipated substantial reductions to follow next year. It appears, at this time, that approximately 55 natural gas companies are planning to use the stencil process of duplicating their 1943 annual reports.

Governing Bodies Cooperate

The meetings with representatives of the various Federal and State regulatory authorities have been most pleasant. They have taken to heart the manpower problems facing the industry and have agreed that the reporting companies might be given some relief in the 1943 reports by the elimination of certain information for that year. The Federal Power Commission, on January 10, 1944, advised the natural gas companies that 23 schedules for the year 1943 need not be prepared for the F.P.C. Annual Report Form No. 2; it also modified its reporting requirements with respect to 4 other schedules in the report. Provision was made for the elimination of those schedules to which the answer is "not applicable" or "none," by the insertion of an "omission sheet," at the front of the report, for the listing of such schedules. For natural gas companies utilizing the mimeographed method of preparation, the Commission agreed to accept the use of 46 schedules from the Annual Report Form for Electric Utilities (F.P.C. No. 1). It is interesting to note that for those companies operating both electric and gas utilities, the Federal Power Commission, on December 29, 1943, agreed to the elimination of some 36 schedules from the 1943 annual report to that Commission on Form No. 1, as well as the modification of 2 other schedules. Such companies may also submit the omission sheet, as indicated for the natural gas companies.

It is the hope of all those who have been engaged in this work that the duplicating process of submitting reports be favorably accepted, not only as a means of alleviating the manpower situation and reducing expense, but also as an indication of cooperative interest with the respective regulatory authorities.

In addition to the efforts expended in connection with the stencil process of duplicating reports, the various committees have

been working on revision of the annual report forms, looking toward simplification and condensation, as well as uniformity. Although considerable progress was made in this respect and the suggestions favorably received by the Committee on Statistics and Accounts of the National Association of Railroad and Utilities Commissioners, it was felt by that committee that insufficient time remained to embody the suggested changes in the 1943 annual reports. It was agreed that both industry and regulatory authorities arrange to get together early enough in 1944 to work on these revisions, so that new forms would be available for the 1944 annual reports. This is a major undertaking and will require considerable time and effort. So far, the work has been directed to revisions of the Federal Power Commission Annual Report Form No. 1 relating to electric utility companies, but it is intended to give consideration to such changes as may finally be decided upon, in so far as they would affect the Annual Report of the Natural Gas Companies.

Within the past month or so, recommendations have made to the Securities and Exchange Commission that, in addition to the schedules eliminated from the annual reports made to that Commission for the year 1942, further eliminations be made for the year 1943. These proposed eliminations are

Utility Accountants To Meet in April

THE annual Spring meeting of gas and electric industry accountants sponsored by the American Gas Association and the Edison Electric Institute will take place Wednesday and Thursday, April 26 and 27 at the Hotel Cleveland, Cleveland, Ohio.

Vital problems of immediate and postwar concern will be discussed by national accounting authorities.

Depreciation Meeting Held in New York

THE Committee on Depreciation of the National Association of Railroad and Utilities Commissioners held a conference in New York City February 2-4 to hear views regarding recommendations embodied in the 1943 Report of the NARUC Committee. Representatives of the American Gas Association and other organizations took part. A further conference will be held March 8 in Chicago at which all member Commissions of the NARUC have been invited to express their views on the Depreciation Report.

Representing the American Gas Association at the February conference were President Ernest R. Acker, H. C. Hasbrouck, chairman of the Association's Committee on Depreciation Accounting, and Randall J. LeBoeuf, Jr., counsel. President Acker presented a memorandum in opposition to retroactive application of depreciation accounting. This memorandum was prepared by a Committee of Executives on Depreciation headed by Arthur F. Bridge which had been appointed to consider the NARUC report.

Among other organizations appearing at the NARUC depreciation conference were the United States Independent Telephone Association, American Telephone and Telegraph Co., Edison Electric Institute, American Water Works Association, The Institution of Water Supply Companies, Association of Mutual Savings Banks, American In-

directed to S.E.C. Forms U5S, U-14-3, 10-K and 8-K. In addition, general long-range recommendations were made that the Securities and Exchange Commission give consideration to the condensation, simplification and uniformity of its reporting requirements, as well as uniformity of definitions. Present indications are that most of these recommendations will be acted upon favorably by the Commission, although nothing definite can be stated at this writing. It is anticipated, however, that by the time this article goes to press the Securities and Exchange Commission will have released its conclusions.

Stimulus of Accountants and Arthur Anderson & Co.

As a result of the general opposition of all interests to the retroactive feature, Nelson Lee Smith, chairman of the NARUC committee, asked that statements be submitted answering five additional questions bearing on this particular proposal.

Joins Controllers

P. R. DUNBAR, comptroller-treasurer of the Seattle Gas Company, Seattle, Wash., has been elected to membership in the Controllers Institute of America. The Institute is a technical and professional organization of controllers devoted to improvement of controllership procedure.

Jansen Joins Zenith

DOLPH JANSEN, Jr., assistant sales promotion manager of Servel, Inc., Evansville, Indiana has recently resigned to become associated with the Zenith Radio Corporation as assistant sales manager of their newly formed radionic hearing aid division.

Mr. Jansen went to Servel in 1935 as assistant to the sales promotion manager in the New York office, and in 1937 was transferred to Evansville, Indiana.

FPC Issues Analysis of Natural Gas Firms

THE Federal Power Commission announced February 13 the publication of a new 87-page report entitled "Statistics of Natural Gas Companies" containing financial and operating information on 118 gas companies which reported an aggregate book investment in gas plant of \$1,759,882,373 as of December 31, 1942. This is the first report of its kind issued by the Commission and was compiled as a part of the Commission's administration of the Natural Gas Act.

The information in the new publication was taken from annual reports of natural gas companies to the Federal Power Commission for the calendar year 1942, and the companies for which data are shown are limited to those which, for administrative purposes, have been determined to be natural gas companies within the meaning of the Natural Gas Act. The compilation does not contain information on all such companies, however, as the jurisdictional status of certain companies remains in question.

Canadian Natural Gas Production

NATURAL gas production from Canadian fields in 1943 showed a decline of nearly 2,500,000,000 cu.ft., preliminary estimates showing a total of 43,237,000,000 cu.ft. for 1943 against 45,697,359,000 for 1942. Comparative figures follow:

Province	CANADIAN GAS PRODUCTION	
	(Thousands of cubic feet)	
New Brunswick	619,380	670,000
Ontario	10,476,770	8,005,000
Saskatchewan	117,124	111,000
Alberta	34,482,585	34,450,000
Northwest Territories	1,500	1,500
Total	45,697,359	43,237,500
	\$13,301,655	\$11,699,894

There was a marked contrast between 1943 drilling operations in Alberta and Ontario, the two major producing provinces. In the former, all that was required to maintain reserves was the drilling of a few large wells in proven fields. However, two new fields were opened, one in the Pouc Coupe area, near the Alaska Highway, where a 5,000,000-cu.ft. gasser was completed, and another in the Athabasca area, north of Edmonton, with 19,000,000 cu.ft. initial production.

On the other hand, Ontario operations consisted of widespread drilling both of proven and wildcat areas, in which producers as low as 20,000 cu.ft. a day or even less were welcomed as aids to a waning supply. One small new field in Zone Township, Kent County, was opened.



Residential SECTION

C. V. SORENSEN, Chairman

J. H. WARDEN, Vice-Chairman

J. W. WEST, JR., Secretary

Cooperative Gas Appliance Sales in the Postwar Era



B. A. Seiple

SPURRED by the efforts of competition for existing business and as a means of increasing the use of gas as a fuel, the gas industry, at the close of the 19th Century, pioneered and developed appliances designed to utilize gas for cooking purposes. In addition to sponsoring these

appliances, it was necessary for the industry to promote and sell, as in those days the appliance business was unprofitable and unwanted, and individual dealers could not have been expected to undertake the costly promotional and sales activities necessary to create the public acceptance of gas for cooking. Thus, gas utility companies, by necessity, went into the merchandising business to protect and increase their gas sales and it is for this reason that they have continued these activities in this field.

Vast Untapped Market

While it is true that, generally speaking, public acceptance of gas appliances is an accomplished fact, it is evident that a tremendous market remains untapped and that the desired saturation points must still be achieved, which is another reason for the utility company to lead the way in appliance merchandising backed by their sales, advertising and varied promotional activities.

With the gas utility company interested in selling appliances as a means to an end, and with the dealer being interested in the same business from the standpoint of merchandising profit, it is only natural that dealers and utility companies have joined hands in cooperative sales efforts for the common good.

For many years the gas industry has been actively engaged in promoting dealer cooperation and has used as a basis of its dealer relations, recommendations and principles suggested early in 1931 by the American Gas Association. This recommendation and basic principles are as follows:

It is recommended that gas companies take the initiative in bringing about conferences with dealers in their localities, to the end that the following or other mu-

By B. A. SEIPLE
Chairman, Subcommittee on Sales Policies, Postwar Planning Committee, American Gas Association

tually acceptable principles may be agreed upon, adopted and put into use for the purpose of stimulating the sale of suitable gas appliances and promoting the use of gas service in a way that will be mutually advantageous to all participants.

1. All gas appliances offered for sale by all cooperating companies shall bear the seal of approval of the American Gas Association Testing Laboratory.
2. No appliances or merchandise not directly related to the use of gas shall be sold by gas utilities.
3. In all merchandising activities, the resale mark-up of all gas appliances that have received reasonable customer acceptance shall be consistent with present-day merchandising practices. There shall be no premiums given with nor trade-in allowances made in connection with the sale of any such appliances unless all cooperating agencies are in a position to participate.
4. The presenting to the public of those gas appliances not having received reasonable customer acceptance shall be considered as promotional activities and not as merchandising activities.
5. Coordinated advertising of approved appliances should be developed by gas utility companies and local dealers, and the gas company should give all reasonable assistance possible to the dealer in advertising, displays and sales assistance.
6. The deferred payment feature of our merchandising activities shall be on an economically sound basis.

These principles were officially approved by the National Association of Master Plumbers, the National Heating and Piping Contractors, the National Retail Hardware Association, and others, and a check made in the Fall of 1932 indicated that 200 companies serving approximately 7,000,000 meters, were utilizing this statement and these principles as a basis for promoting cooperative dealer relations.

In 1934 a further survey showed substantial progress in this field as a total of 194 companies in the manufactured and mixed gas industry, representing 71% of the total manufactured gas customers, and 102 natural gas companies representing 62% of the natural gas industry of the United States were using dealer plans based on the Association's principles. Further results of this survey are shown at the bottom of this page.

Nearly 10 years have passed since the last survey was recorded and in the meantime the number of dealer outlets has substantially increased and gas appliance sales volumes have reached new peaks as a result of the sales activities by the utility company, dealer and manufacturer. What is the picture today? What will it be tomorrow? Where do utility companies

The scope and application of the cooperative efforts of the 194 companies mentioned above are shown below:

95%	cooperated with plumbers	96%	applied to water heating
72%	" " heating contractors	81%	" " ranges
61%	" " furniture stores	71%	" " house heating equipment
57%	" " hardware stores	69%	" " gas refrigeration
47%	" " department stores		
11%	" " other stores not classified in the above fields		

These companies listed 11,460 dealer outlets and 43% of the companies reported that they carried dealer appliance sales paper.

The scope and application of the cooperative efforts of the 102 companies follows:

96%	cooperated with local plumbers	97%	applied to water heating
85%	" " furniture stores	85%	" " house heating
83%	" " hardware stores	75%	" " ranges
81%	" " heating contractors	63%	" " refrigerators
58%	" " department stores		
4%	" " other stores not classified in the above fields		

These companies listed 4,800 cooperating dealers and 21% of the companies assisted the dealers in financing appliance sales.

stand regarding gas appliance merchandising in the postwar era? Can the dealer expect more or less cooperation and assistance from gas utility companies in gas appliance merchandising?

In an effort to ascertain the answers to these questions and as a means of determining conditions under which appliances must be manufactured and distributed in the postwar era, the Subcommittee on Sales Policies of the Postwar Planning Committee of the American Gas Association recently conducted a survey among a group of gas utility companies representing 15,497,459 meters or 82.5% of the national total. Of this total, a group of companies representing 2,406,013 meters were undecided on the type of gas appliance merchandising plans which they would utilize in the postwar period; accordingly, these have been deducted from the prewar total leaving companies representing 13,091,446 meters, which are fully decided on their postwar gas appliance merchandising activities.

COMPANIES RETAILING AND/OR DISTRIBUTING AND/OR WHOLESALING GAS APPLIANCES

	Prewar	Postwar
Ranges	75.9%	87.9%
Refrigerators	67.9%	77.6%
Water Heaters	84.0%	87.6%
House Heating	84.4%	84.7%

COMPANIES ASSISTING DEALERS IN GAS APPLIANCE SALES

	Prewar	Postwar
Ranges	86.0%	92.4%
Refrigerators	79.2%	86.4%
Water Heaters	86.9%	93.5%
House Heating	90.3%	91.9%

Sorenson To Direct Gas Kitchen Program



C. V. Sorenson

AT its meeting February 16 the Executive Board of the American Gas Association approved the Coordinated Gas Kitchen program recommended by the Postwar Planning Committee.

The program will be financed jointly by members of the American Gas Association and the Association of Gas Appliance and Equipment Manufacturers.

C. V. Sorenson, chairman of the Residential Gas Section, will serve as coordinator of the efforts of the manufacturers and utilities in developing the Coordinated Gas Kitchen sponsored by the Association's Postwar Planning Committee. A special committee under the chairmanship of John H. Warden, vice-chairman of the Residential Gas Section and sales manager of the Oklahoma Natural Gas Company of Tulsa, Okla., has charge of the promotional as-



Attractive Home Service Booth of the Boston Consolidated Gas Company. Susan A. Mack is home service director for the company

pects of the program under the guidance of Mr. Sorenson. Members of this committee include:

Wallace M. Chamberlain, Michigan Consolidated Gas Co., Grand Rapids, Mich.
J. L. Johnson, Providence Gas Co., Providence, R. I.
J. C. Sackman, Northern Indiana Public Service Co., Hammond, Ind.
C. S. Stackpole, Consolidated Gas Electric Light & Power Co. of Baltimore, Baltimore, Md.
Bernard T. Franck, Milwaukee Gas Light Co., Milwaukee, Wis.
Frank M. Houston, Rochester Gas & Electric Corp., Rochester, N. Y.
Leon Ourusoff, Washington Gas Light Co., Washington, D. C.
Miss Jessie McQueen, American Gas Association, New York.

The committee also will include representatives of the Association of Gas Appliance and Equipment Manufacturers.

Postwar Appliance Survey Nears Completion

DURING the past several months, hundreds of answers to the questionnaire on Postwar Gas Appliances sent to all gas utility companies late in October of 1943, have been received and collated, and final reports are now in the process of being prepared. It is the purpose of this comprehensive questionnaire to seek answers to vital questions from the utility companies, regarding the improvements they believe necessary and desirable to prewar domestic gas appliances, new appliance developments, and their ideas and recommendations on the evolution of new appliances.

Prepared by the Committee on Improving

Domestic Gas Appliances of the Postwar Planning Committee, F. M. Rosenkrans, chairman, the questionnaire is the first of its kind utilized by a major industry, and the results will be a major factor in the gas industry's postwar drive to maintain and increase public acceptance of gas services.

Specifically designed to cover the major residential gas appliances, including ranges, refrigerators, water heaters, house heating and air conditioning equipment, the survey results will be released separately for each appliance on both a regional and national basis. It is expected that the range report will be completed by mid-March, 1944, with reports on the other appliances to follow at scheduled intervals thereafter.

Gas utility companies have kept in close contact with the local consumer, and have their fingers on the pulse of the public. In many instances, their answers to the questionnaire is based on the findings and results of local appliance surveys made among their local customers. In addition to the utility viewpoint, the complete report will include the ideas and recommendations of a representative group of department stores throughout the country.

Indicative of the interest by the gas utility industry in this important undertaking, is the fact that complete answers were received from gas companies representing 15,271,956 meters or 81.3% of the total gas meters in the United States.

"The war has adequately and thoroughly impressed the Federal Government, the war agencies, the war industries, the Armed Forces and the civilian population with the vital and immeasurable importance of the position occupied by the gas industry."—ALEXANDER FORWARD

Students Learn How to Pack Lunches

IN war plant areas, where almost everyone of working age is in the production line, the young people have increasingly taken their places as homemakers. To them, in many cases, has fallen the duty of selecting rationed foods, preparing home meals and noonday lunches. To meet this situation, the Peoples Natural Gas Company of Pittsburgh has been conducting a food demonstration program for high school students.

The "Lunchtime" program, presented by Mrs. Lemabel Parry, home service supervisor of Peoples, has proved popular with the ten school groups to which it has already been presented. Planned for presentation before the home economics high school classes in the company's territory, requests were made by several principals of schools having large commuting enrollments to include the entire student bodies. This resulted in swelling the attendance to a total of 4100. One school assembly numbered 1100. The demonstration takes fifty minutes and is divided into two sections.

A discussion of the Basic Seven Food chart is the basis for the opening discussion. The giant size lunchbox shown in the photograph contains large colored food models which are food items from the seven groups that can be used in a lunchbox menu. Note the size of bread and ham, groups six and five respectively. They mean ham sandwich in every language!

The second part of the demonstration is the preparation and packing of a lunch, following the text of the leaflet "Helpful Suggestions for Healthful Lunches."

Three lunches are prepared and given to lucky winners.

In one high school where there is a class of boys who hope their cooking lessons will make them "mess sergeants" eventually, they so heartily approved the baked bean filling that none remained for the demonstration!

It has been found that the women in Red Cross Nutrition classes enjoy this demonstration, too. In their case, the demonstration supplements the lesson on "Meal Plans" and more recipes are included in the discussion so the program naturally lengthens to about an hour and a half.

The leaflet has served as bulletin for the Home Volunteer mailing list compiled by the company, as well as a means of introducing the activities to the company personnel, since the Home Service Department is new to The Peoples Natural Gas Company.

It has also been found that while the students have seen the Basic Seven Food chart on display in various places in their community, they have not made practical application of the information until after they have seen the "Lunchtime" demonstration presented.

Regional Home Service

WITHIN the space of one month three regional gas associations held or plan to hold home service meetings. These meetings reflect a wide variety of activities and wartime contributions.

Southern

A meeting of the home service group

will be held in conjunction with the annual meeting of the Southern Gas Association in New Orleans, March 22-23. Cephalie Lewis, Atlanta Gas Light Co., chairman, indicates that the program will include such subjects as work with children, visual aids and demonstrations, revived interest in nutrition and food preservation plans for 1944.

Speakers will include home service representatives in a group of southern states, including Oklahoma, Texas, Louisiana, Georgia, Mississippi and Alabama.

Pacific Coast

Marguerite Fenner, home service chairman, Pacific Coast Gas Association, announces a Home Service Conference on March 1-2. Part of the program, entitled "What's New in Food Preservation," covering canning, bottling and dehydration, includes a discussion by Amelia Sansom, University of California Extension Service.

Government, state and local authorities are slated to provide a full discussion of the "Nutrition in Industry Program," and another full discussion is planned on the "Food Fights for Freedom" program. Highlight of the luncheon program is a talk on "Homes and Kitchens of the Future" by Jan Riener, San Francisco architect.

New England

Home service groups of the New England Gas Association met Feb. 25 in Boston in connection with the Sales Managers' Conference. A feature of this meeting was a roundtable discussion of plans and programs led by Mrs. Hazel Cheever, Malden Electric Company. Talks were also made on "Home Service Floor Displays" by Margot Whitmire, Springfield Gas Light Co., and on "The 1944 Food Preservation Program" by William R. Cole, extension specialist in food preservation, Massachusetts State College.



Mrs. Lemabel Parry, home service director, Peoples Natural Gas Co., Pittsburgh, uses giant-sized food and lunch box models to illustrate the importance of the lunch in daily diet. The display is part of Mrs. Parry's better lunch campaign conducted for such school student groups as that shown here





Industrial & Commercial Gas SECTION

CHARLES G. YOUNG, Chairman

HARRY K. WRENCH, Vice-Chairman

EUGENE D. MILENER, Secretary

Radiant Gas Heat Serves World's Largest Airships



Pan American Airways Photos

Clipper taking off from LaGuardia Field, New York

AN unusually clear example of the speed and efficiency of radiant heating is furnished by the large gas-fired salt bath aluminum heat-treating furnace in the new shops of Pan American World Airways at La Guardia Field, New York's Municipal Airport. Here the famous Clippers and other large flying boats are thoroughly gone over and repaired between their trans-Atlantic flights.

Realizing the advantage of being able to anneal and harden the aluminum alloy parts used in the repair work with minimum delay, Pan American incorporated in the plans for its new shops a salt bath heat-treating furnace capable of handling sheets up to 14 feet long and 4 feet wide. As all the equipment installed in these new shops is of the most modern type, it was only natural that the finest in heat-treating furnace should be selected. After giving due consideration to the merits and costs of various furnace designs and heating media, Pan American decided upon a gas-fired unit equipped with radiant burners.

Cost studies indicated that gas fuel offered the greatest economies, both in operation and maintenance. It had the additional advantage of being ideally suited to automatic operation and temperature control. The intermittency of its use was also a factor governing the fuel choice. While pot furnaces of this same general size, shape and purpose are now in existence, both gas-fired and electrically heated, it is believed that none other embodies this particular advanced method of gas heat application.

The pot containing the salt bath is 14'0" long, 2'6" wide, and 5'0" deep on the in-

By F. K. WHITESIDE*

Engineer of Industrial Gas Utilization,
The Brooklyn Union Gas Company,
Brooklyn, N. Y.

side. It is constructed of 1½" firebox steel with double welded seams. Around the top of the pot is welded a 7-inch structural steel channel with the flanges turned downward. The outer flange of this channel fits into a sand seal at the top of the furnace setting. The pot weighs approximately 5,500 pounds and holds, when full, ten tons of salts. A mixture of sodium and potassium

nitrates, with a melting point of 425° F., is used.

The operating temperature ranges between 650° F. for annealing, and 920° F. for solution heat-treating.

As the furnace is used intermittently as the need arises, the time required for heating up is of considerable importance. This requirement was one of the principal factors which brought about the selection of radiant burners. Another determining factor was the necessity of obtaining absolute uniformity of heating. To satisfy these requirements, heating by a multiplicity of radiant burners was decided upon. Since 70 per cent of the area of the pot surface is in the two sides, and since the width is quite small as compared with the length and height, only the sides are used for direct heat absorption from the radiant burners.

The burners which were selected for this application are the all-ceramic Duradian burners manufactured by the Selas Company of Philadelphia. A view of one of these burners is shown in Figure 1. Gas and air in proper proportions for perfect combustion issue from the burner tip in a large number of small streams tangent to the burner cup. The design of the cup is such that the products of combustion swirl back toward the burner tip in sort of an involute curve. They therefore do not issue from the burner at a high velocity or in a direct straight line. Because of this characteristic, it was possible to place the faces of the burners no further than eight inches from the pot without danger of flame impingement and hot spots. The surface of the burner cup is corrugated, and the resulting turbulence causes instant ignition and holding on of the flame to the burner tip. The combustion products soon raise the

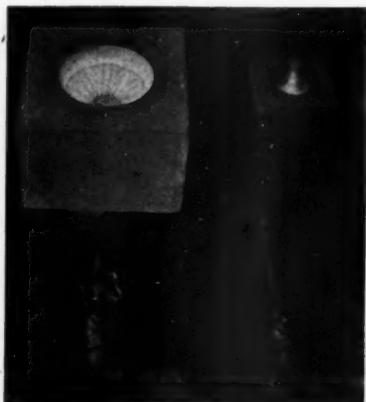


Figure 1—Typical ceramic-cup radiant gas burner (left) shown during throttled operation, as compared to typical conventional single-port burner (right) operating at the same input, air-gas ratio, etc. Note the uniformity of incandescence in cup, and absence of flame beyond burner face

* Member of Aluminum and Magnesium Melting Committee of Industrial and Commercial Gas Section.

burner cup to incandescence and provide the radiant heat from which the burner obtains its name.

With this particular relation between burners and object being heated, there exists an ideal condition for heat transfer. The pot wall for all practical purposes is a black body and absorbs most of the radiant heat directed toward it. The heating source is at a relatively high temperature and is located very close to the object being heated. It was found that when heating the furnace up from a cold start to 920° F., 70 per cent of the B.t.u.'s were effectively utilized in heating the pot and the salts.

It was interesting to discover how little heat was absorbed by the furnace setting during the heating-up period. By subtracting the calculated heat in the flue gases from the remaining 30 per cent, it was found that only 4 per cent was unaccounted for. The greater part of this 4 per cent was absorbed by the furnace walls and piers. Only a small portion was lost by radiation from the furnace.

For purposes of stability, the furnace side walls are constructed of 9 inches of insulating firebrick with no additional insulation. In order to contain the flues, the end walls are of insulating firebrick 13½ inches thick. The bottom is constructed of 5 inches of insulating firebrick backed up by 1½ inches of block insulation. During operation, because of the radience from the burners, the furnace walls appear also to be incandescent, but shortly after the burners are shut off, it is apparent that what appeared to be heat in the walls was only a reflection from the pot.

When designing the furnace, one of the chief causes of concern was that the salt might not be able to absorb the heat as fast



Figure 3—Front of furnace showing burners and proportional gas mixers. Note pilots on uppermost burners

as it was generated. This fear was later found to be groundless. At no time during the heating up period do the pot sides become overheated. If when the salt bath is approaching a temperature of 920° F., the burners are shut off, only by the closest scrutiny can any color be detected either in the furnace or pot walls.

So complete is the absorption of heat by the salt that while heating up, the products of combustion leave the furnace at a temperature not exceeding 100 degrees higher than that of the salt. Before leaving the furnace, the flue gases are required to travel to the bottom of the setting and thence underneath the pot to the flue openings in the end walls. The furnace therefore operates under considerable pressure; hence the need for the sand seal at the top. When at operating temperature the ends of the pot fit

snugly against the end walls of the furnace, thereby preventing the products of combustion from short circuiting. The pot actually expands one inch in length and about ½ inch in height when heated.

In order to obtain uniform distribution of heat, 44 Selas Duradian burners are used, half of these being on each side of the furnace. The burners are placed in three horizontal rows spaced 15 inches apart vertically. There are eight burners in the top and center rows and six in the bottom row on each side. The burners are manifolded in eight groups of four and four groups of three, making twelve groups in all. Each group is supplied with its properly proportioned mixture of air and gas by a low pressure Proportional Mixer and individual zero regulator on the gas line. Air is supplied by a Spencer Turbo-Compressor operating at 24 ounces pressure. The gas used is a mixture of coke oven and carbureted water gas having an average heating value of 540 B.t.u. per cubic foot and a specific gravity of 0.60.

The furnace has an hourly gas demand of 4500 cubic feet and at this rate of consumption can be heated from cold to 920° F. in slightly less than 5 hours.

For purposes of automatic temperature control, the furnace is divided into two zones, each independent of the other. The air supply to each zone is controlled by a three-position motor operated valve actuated by a Wheelco Capacitrol. While heating up, the air valve is in the wide open position. As the required temperature is approached, the valve closes part way. When the control temperature is reached the valve closes to a minimum setting which is just sufficient to keep the burners in operation. North American adjustable port valves are used. They are set to give a pressure drop of 4 ounces. By actually sizing the valve to the demand in this manner, the flow through the valve in its various positions can be accurately controlled.

With an enormous storage of heat in the molten salt, and with a well-insulated setting, it can readily be imagined that one of the main difficulties of operation is to keep the temperature from rising if the

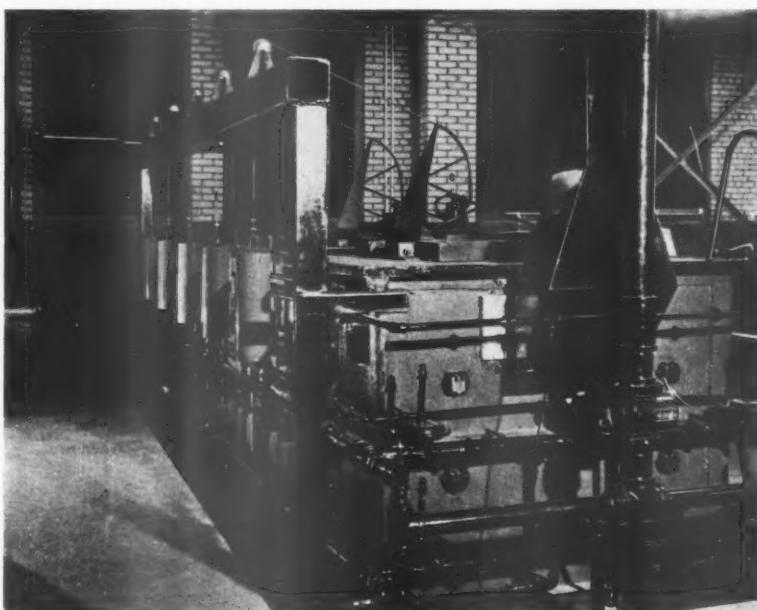


Figure 2—View showing hinged covers and method of counterweighting

burners remain on with no work being heated in the furnace. It has been found that the salt bath temperature can be automatically controlled within plus or minus 5° F. by operating on the lowest twelve burners. A fair idea of the magnitude of heat storage may be obtained when it is realized that it takes seven days for the salt temperature to drop 700 degrees. The latent heat of fusion of this mass of salt is equal to the amount of heat generated by burning approximately 2000 cubic feet of gas. This heat, of course, is released when the salt solidifies.

The initial lighting of a furnace of this size with completely enclosed setting and with a large number of burners presented a problem, especially since one end of the furnace is only four feet from an exterior building wall. This precluded the use of a long torch inserted from the end of the furnace. A satisfactory piloting system was worked out by applying small sealed-in pilot burners to the sixteen Duradian burners at the uppermost level. These pilot burners are manifolded in groups of four

and are of the premix type, using air at approximately 8 ounces pressure. They fire into specially constructed burner tunnels which line up with the lighting holes in the burner blocks.

To obtain the proper alignment of the pilot burners, to ram the tunnels and to center the pilot burner supporting brackets, a single mandrel was developed. Although experiments had indicated that these pilots would ignite the Duradian burners without any delay, extra precautions were taken. Small baffles made of $\frac{1}{8}$ " x $\frac{3}{4}$ " Inconel strip were placed about one inch in front of the face of the lighting holes so that the pilot flames are deflected downward in front of the burner cups. Ignition therefore takes place instantly. When the top row burners are lighted, the pilots are turned off. The burners in the middle and lower rows are then ignited from the burners above.

In a repair shop such as that of Pan American World Airways, considerable flexibility of equipment is desirable. With this in mind the furnace is provided with

five individually hinged and counterweighted covers. A working opening varying between 3 feet and 14 feet in length can be made available. These covers are constructed of 3-inch channel iron and are lined with cast insulating concrete reinforced and securely anchored in place. On the under surface of the cover, the insulating material is directly exposed to the heat. There is no steel plate there to warp and get out of shape.

Figure 2 shows the method of counterweighting. The purpose of the odd-shaped framework on top of each cover is to balance the cover in all positions. This is effected by constantly changing the lever arm through which the lifting cable acts. Therefore with a constant pull provided by the counterweight, the effective moment decreases as the cover raises. When the cover is in the vertical position the direction of the cable, if extended, will pass through the hinge, with a resulting moment of zero.

As a safety feature, the gas supply to each half of the furnace passes through an Eclipse Dual-Lock valve which automatically closes upon the failure of either the gas or air pressure. When once closed, this valve must be opened manually before gas again becomes available at the burners.

It will be observed in Figure 3 that the furnace is set in a pit. This pit is 30 inches deep. For convenience of operation, the furnace would have been sunk deeper were it not for the fact that the ground water level is exceedingly high at this location. Although the foundation pit was waterproofed, it was not considered advisable to risk serious damage to the furnace should ground water seep into the pit.

All materials for the installation were supplied by Pan American World Airways who also performed all the labor on the job with the single exception of the installation of the pot. This was done by a firm of professional riggers.

The furnace embodies one of the most recent developments in gas combustion equipment and has clearly demonstrated to Pan American the advantages claimed for radiant heating. They, in turn, have expressed their satisfaction with the installation, which promises to earn a good return on the capital invested in it. For every day that one of the huge Clippers is laid up for repairs, a loss of operating revenue results. By speeding up repairs, the furnace does its bit toward keeping the ships in the air.

American Gas Association Industrial and Commercial Gas Advertising for March

The National Advertising Committee of the Industrial and Commercial Gas Section, J. P. Leinroth, chairman, and F. B. Jones, vice-chairman, announces that full page advertisements will appear in the trade and business magazines listed below during the month of March. These advertisements are prepared in cooperation with the Committee on National Advertising as a part of the industry's national advertising campaign.

MAGAZINE

THEME

General Manufacturing

BUSINESS WEEK (Mar. 25—
3/4 page) Modern GAS Heating is a MACHINE TOOL!

Metals Industry

INDUSTRIAL HEATING (Mar. 9) NOW high-speed direct GAS heat-treating on a production line basis!

Glass Field

It takes a giant slide-rule to chart the future of GLASS. War's new uses . . . and awakened versatility for peace . . . give fresh energy to this front rank industry in which GAS firing plays so important a part!

Baking Field

Peacetime bakeries will be better off because of the war! They'll have the benefit of improved GAS baking equipment.

Restaurant Field

Getting set for postwar operation? Check into how GAS equipment, drafted for war, is being improved for peace!

Hospital Field

The "wounded don't cry" . . . but they do need to eat! And modern GAS cooking equipment in our military hospitals is helping to speed their recovery.

Institutional Field

The Military's experience with modern GAS equipment will help you after the war!

RESTAURANT MANAGEMENT
AMERICAN RESTAURANT

MODERN HOSPITAL

INSTITUTIONS (Mar.—2/9
page)

Magazines Added to Gas List

At its recent meeting the National Advertising Committee of the Industrial and Commercial Gas Section added two important magazines in the food service equipment field to the list of those now being used for national advertising. These are: "Institutions" and "American Restaurant."

"Institutions" is a unique magazine in

this field as it covers all types of institutions where food is prepared in quantity. It has a large subscription list in the hotel, restaurant, club, lunchroom, industrial cafeteria, army and navy bases, and related institutions in this field. Its vigorous editorial policy is directed primarily to equipment and it has been found to be a valuable and important advertising medium by a number of successful advertisers.

"American Restaurant" specializes in the restaurant and lunchroom field. While its editorial policy is not concerned primarily with equipment used in restaurants, equipment and its use do receive good treatment along with other subjects that are important to the owners and managers of restaurants and lunchrooms.

With the addition of these two important magazines, the list of media used by A. G. A. Industrial and Commercial Gas Advertising becomes an impressive one. The list is as follows: Iron Age; Steel; Metals & Alloys; Metal Progress; Ceramic Industry; Glass Industry; Bakers Weekly; Restaurant Management; American Restaurant; Hotel Management; Modern Hospital; Institutions; Industrial Heating; Business Week.

Appointed Manager of Industrial Department



Paul W. Craig

PAUL W. CRAIG, senior engineer of the Equitable Gas Company, has been appointed manager of the Industrial Sales Department.

Mr. Craig was born at Uniontown, Pennsylvania, and is a graduate of Carnegie Institute of Technology with a B.S. degree in civil engineering. He entered the employ of the Equitable Gas Company in 1924 as a cadet engineer, and held positions as district foreman, field engineer, supervisor of industrial installations, and supervisor of heavy industrial sales, prior to his present appointment.

"Tips on Tables" Boosts Gas Ceramic Heat

IN these days of food rationing when fish and chickens play a large part in the wartime restaurant menu, it is interesting to note that gas heat is playing a prominent part in their preparation at famous eating establishments in New York City. Paul Martin, well known author of the food column "Tips on Tables," appearing regularly in *The New York World Telegram*, made the following comment in two separate columns published in February:

DIRECTIONS FOR CORRECT OPERATION OF BAKE OVEN

Based on Instructions from the Washington Gas Light Company

1. Preheat oven for 1½ hours before starting bake.
2. Wait until flame turns down on burner before putting bake into oven.
3. When two decks are operated by one thermostat, load lower one first.
4. Load and remove baked goods as quickly as possible.
5. Avoid opening oven doors during bake.
6. Have an equal amount of baked goods on each deck.
7. Bake at correct temperatures—watch time.
8. Remove baked goods from lower deck first.
9. You cannot immediately change temperature simply by turning control—You must wait for oven to heat or to cool.

CAUTION: Do not change thermostat setting without asking your supervisor.

Manager

There is no such thing as "Luck" in baking

The above set of directions for correct operation of gas bake ovens was prepared especially for cafeterias in government buildings in Washington and vicinities. It was compiled by James A. Hayes, industrial representative, Washington Gas Light Company.

"Enrico and Paglieri is famed for its broiled chicken as well as for its Italian-American dishes. Chickens are broiled on a revolving broiler that will hold 100 portions at a time, one of the showpieces of the restaurant and the only one of its kind in New York. The chickens are split and

broiled on both sides at once in a gas ceramic heat, emerging a delicate golden brown, dripping in their own juices."

"In Roberts Sea Food restaurant, visible to the dining room through a glass-front kitchen, is that mark of all good sea fare restaurants, a special gas ceramic broiler for fish."

Thank you, Mr. Martin!

Small Fry

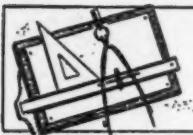


"Him? He's the new short order cook!"
(From "Institutions")

Food Management To Be Studied

THROUGH its Business Problems Bureau and the School of Business, the University of Chicago has entered into an arrangement with the National Restaurant Association for the development of research and educational work bearing upon foods and restaurant management. The announcement was made on December 27 by President Robert M. Hutchins of the University.

President Hutchins' announcement explained that the National Restaurant Association, which comprises approximately 5,000 owners of restaurants in all parts of the nation, is making an initial gift to the University that may approximate \$100,000 for the project.



Technical SECTION

CHARLES F TURNER, Chairman

L E KNOWLTON, Vice-Chairman

A GORDON KING, Secretary

Program Committees Map Plans for Distribution and Production and Chemical Conferences



Charles F. Turner, Cleveland, chairman of the Technical Section, and J. V. Postles, Philadelphia, chairman, Committee on Postwar Planning Cooperation



C. C. Russell, Pittsburgh, chairman, Subcommittee on Carbonization and Coke; Charles Koons, Kearny, chairman, Safety Subcommittee; and L. E. Knowlton, Providence, vice-chairman, Technical Section

At important meetings of Technical Section committees held in New York January 19 and February 10, plans were perfected and tentative programs prepared for the annual Spring conferences. In the course of selecting subjects and speakers for the programs, the entire fields of gas distribution, production and chemical developments were reviewed. Special attention was paid to postwar adjustments and operating problems, although current problems held a prominent place in the discussions.

The Distribution Program Committee held the first meeting January 19 and completed a tentative program for the Distribution Conference which will be held April 18 and 19 at the Hotel Statler, Cleveland, Ohio.

A. C. Cherry, The Cincinnati Gas & Electric Co., Cincinnati, will preside.

Program committees for the Joint Production and Chemical Committee Conference, under the chairmanship of Dr. C. W. Wilson, vice-chairman of the Chemical Committee, and R. Van Vliet, vice-chairman of the Gas Production Committee, met February 10 to review developments in their fields from the standpoint of conference presentation. A large number of timely subjects was selected and national authorities are being invited to participate. The conference will take place June 6 and 7 at the Hotel Pennsylvania, New York, N. Y. F. J. Pfluke, Rochester Gas and Electric Corp., chairman of the Gas Production Committee, and V. J.

Altieri, Eastern Gas & Fuel Associates, Everett, Mass., chairman of the Chemical Committee, will preside at alternate sessions.

The Technical Section looks forward with especial interest to its two 1944 conferences as they will be the first under the auspices of the newly organized Manufactured and Natural Gas Departments of the Association.

Following are program details resulting from the committee meetings:

Distribution Conference, April 18-19, Cleveland, Ohio

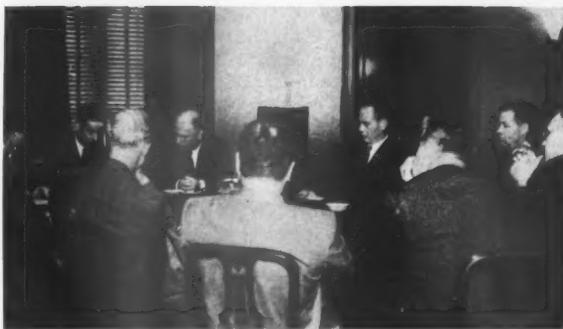
An outstanding feature of the first morning session is expected to be an address by J. French Robinson, president, The East Ohio Gas Company, Cleveland, and vice-



H. W. Nicolson, Newark, chairman, Subcommittee on Construction and Maintenance; A. C. Cherry, Cincinnati, chairman, Distribution Committee; and T. H. Kendall, Pittsburgh, vice-chairman, Distribution Committee



R. F. Hadley, Philadelphia, chairman, Subcommittee on Pipe Coatings and Corrosion; H. B. Andersen, Philadelphia, chairman, Subcommittee on Economics of Distribution Design; and C. C. Jones, Philadelphia, chairman, Subcommittee on Cast Iron Pipe Standards



Meeting of Distribution Program Committee with A. C. Cherry, committee chairman, presiding (second from left)



Gladys Hanshaw, A. G. A. staff, and F. J. Fluke, Rochester, chairman, Gas Production Committee



J. S. Haug, Philadelphia, chairman, Committee on Gas, Coke and Byproduct-Making Properties of American Coals; and R. Van Vliet, Stapleton, vice-chairman, Gas Production Committee



A. C. Sedlachek, Philadelphia, chairman, Production Luncheon Conference Committee, and F. W. Harzel, Philadelphia, chairman, Water Gas Subcommittee



Donald Whitcomb, Atlantic Highlands, chairman, Safety Subcommittee; S. P. Cobb, New York, member, Managing Committee; and F. A. Engel, Elizabeth, member, Distribution Committee



L. M. Harris, Paterson; A. V. Smith, Philadelphia, 1943 winner of Beal Medal; and C. S. Goldsmith, past chairman, Distribution Committee—all current members, Distribution Committee



James M. Beall, New York, editor, A. G. A. MONTHLY, and R. E. Titus, Brooklyn, member, Gas Production Committee



Louis Shnidman, Rochester, chairman, Chemical Luncheon Conference Committee, and Dr. C. W. Wilson, Baltimore, vice-chairman, Chemical Committee

president of the American Gas Association. He will have the opening spot on the program following the remarks of Chairman A. C. Cherry of Cincinnati.

Alexander Forward, managing director of the Association, an always welcome visitor to Technical Section conferences, will then address the gathering. Next will be an interesting presentation on a matter of current interest to all distribution men, the speaker and subject to be announced later. The concluding part of the first morning session is expected to deal with the training of drivers and the safe operation of motor vehicles, to be followed by discussion.

Upon adjournment of the first morning session, the popular round-table luncheon conferences will get under-way. One on Pipe Coatings and Corrosion will have as its chairman the former Beal Medal Award winner, R. F. Hadley, Susquehanna Pipe Line Company, Philadelphia, Pa., who is chairman of the Section's Subcommittee on Pipe Coatings and Corrosion.

Luncheon No. 2 will be a general discussion of the work of the Technical Section's Committee on Work on Customers' Premises, J. M. Pickford, chairman, and will deal with this subject.

Convening the next morning, Wednesday, April 19, at 9:30 A.M., another practical paper on pipe coatings, a matter of vital interest to distribution engineers, is planned.

Postwar Topics

Next will come the important matter of postwar consideration from the Technical Section's point of view and the chairman of the Section's Committee on Postwar Planning Cooperation, J. V. Postles of Philadelphia, will present a summary of technical studies on postwar problems. He will be followed by the former chairman of the Distribution Committee, H. B. Andersen of Philadelphia, who is chairman of the Subcommittee on Economics of Distribution Design for Domestic Load Building. Mr. Andersen's subject is Postwar Distribution Studies.

The next scheduled paper for the tentative program, the speaker of which has yet to be announced, will deal with Postwar Appliance Design from the Servicing Viewpoint.

Because there has been such a great demand for copies of the cast iron pipe standards publication of the Association, the chairman of the subcommittee having this matter in hand, C. C. Jones of Philadelphia, will present an interim report. The presentation of the other subcommittee reports will bring the morning session to a close.

Two round-table luncheon conferences will wind up the conference. The first will be on Meters and Metering and the second on Construction and Maintenance. Chairmen will be J. H. Collins, of New Orleans, chairman of the Distribution Committee's Subcommittee on Meters and Metering, and H. W. Nicolson of Public Service Electric & Gas Company, Newark, N. J., chairman of the Distribution Committee's Subcommittee on Construction and Maintenance.



L. G. Kreuz, of Detroit, chairman, High B.T.U. Gas Subcommittee, who attended the Gas Production Program Committee meeting Feb. 10. Mr. Kreuz is newly appointed assistant general manager, Detroit district, Michigan Consolidated Gas Company. Other members of his subcommittee are: Fred H. Bunnell, Jackson; J. A. Clark, Clarksburg; P. L. Covell, Minneapolis; L. A. Kirk, Indianapolis; and G. J. McKinnon, Detroit

Joint Production and Chemical Committee Conference, June 6-7, New York, N. Y.

Meeting separately on the morning of February 10 and jointly in the afternoon, program committees of the Chemical and Gas Production groups outlined a program for a two-day conference of three sessions and one afternoon of luncheon conferences.

V. J. Altieri, Everett, chairman of the Chemical Committee, will open the first session Tuesday with an address outlining the latest chemical developments. He will then introduce the Association's officers, Ernest R. Acker, president, and Alexander Forward, managing director, who will address the conference.

The remainder of the morning program will be devoted to papers on the "Future Availability of Coal," "Coal and Oil Research—Bureau of Mines Index," "Gas Conditioning" and "Safety." J. S. Haug, Philadelphia, chairman, Subcommittee on Survey of Gas Coke and By-Product-Making Properties of American Coals, will discuss coal and oil research and Charles Koons, Kearny, chairman, Subcommittee on Safe Manufactured Gas Operations, will talk on safety. Ample time is being allowed for discussion from the floor.

In connection with the subject of safety, the program meetings emphasized the more active part the Technical Section will take in the work of the general A.G.A. Accident Prevention Committee. In addition to Mr. Koons, the Section will be represented on the general committee by L. K. Richey, of

Detroit, chairman of the Subcommittee on Safe Distribution Practices. Both Messrs. Koons and Richey, in representing the Technical Section, will be assisted by subcommittees and, to date, the following have accepted appointments as chairmen: Mr. Koons, Production; Donald Whitcomb, Atlantic Heights, N. J., Distribution; and N. C. Carter, Conshohocken, Pa., Chemical.

The afternoon session will begin with an address by F. J. Pfleke, chairman of the Gas Production Committee. Highlights of this session are expected to be the address of George S. Hawley, chairman of the Manufactured Gas Department and past president of the Association, and a postwar planning symposium led by J. V. Postles, chairman of the Technical Section's Postwar Committee. A representative of the general Postwar Planning Committee, A. M. Beebe, Rochester, chairman, will take an active part in the symposium.

Other important topics at this session will be: "Increasing Water Gas Capacity" by a national gas industry authority; "Use of Oxygen in Gas Production," by Dr. S. P. Burke, Columbia University; "Automatic Coke Stokers"; and "High B.T.U. Gas," by L. G. Kreuz, chairman, Production Subcommittee on High B.T.U. Gas.

The third session, Wednesday morning, will embrace a number of important presentations including papers on "Mixed Gases," "Butadiene Manufacture," "Substitute Gas for Coke Oven Gas," "Combustible Gas Detectors," and negotiations are pending looking toward a presentation on the identity and control of stilbaceous mold in purifying material. Of unusual interest will be a discussion of "Gas Enriching Oil from the Viewpoint of the Gas Industry" by P. T. Dashiel, vice-president, The Philadelphia Gas Works Company.

Completing the conference program, Wednesday afternoon will be devoted to four round-table luncheon conferences covering the following subjects: Carbonization and Coke; Chemistry in the Gas Industry; High B.T.U. Gas; and Water Gas Operation. These luncheon meetings have always been among the most popular and informative sessions of the annual conferences and many topics are slated for discussion.

Further details of the Spring technical conferences will appear in later issues of the MONTHLY.

Seil Joins Philadelphia Engineering Firm

GILBERT E. SEIL has resigned from G. E. J. Lavino & Company to become associated with the engineering firm of Day & Zimmermann, Inc., Philadelphia, as technical consultant.

Dr. Seil is author of the Gas Chemists' Manual of Dry Box Purification of Gas, recently published by the Technical Section of the American Gas Association. He is a long-time member of the Association's Chemical Committee and has taken an active part in many of its projects.

Book Review

(From THE GAS WORLD, London,
January 8, 1944)

GAS CHEMISTS' MANUAL OF DRY BOX PURIFICATION OF GAS, by Gilbert E. Seil, published by the American Gas Association, 420 Lexington Avenue, New York 17, N. Y.

This book is an authoritative working guide on matters relating to the removal of H₂S from gas through the medium of dry-box purifiers. It is specially designed to present the fundamentals in simple form so that the information may be readily understood. The author, a chemical engineer of recognized standing, reflects in striking fashion both the theoretical advances made and the variety of gas plant practices.

The book presents the fundamentals concerning oxide purification. It includes a complete account of recent developments in the art of evaluating purifying materials, specifications, tests, and other standards. This book, as a whole, is the outcome of extensive gas engineering practice in the art of dry-box purification. In its preparation valuable ideas and suggestions have been assayed, incorporating those found to be of value. It may well prove to be a landmark in this branch of gas engineering.

BURNER RESEARCH

(Continued from page 112)

tional to the heating value of the gas. It can be shown by calculation that coke oven gas even at a pressure of 3½ in. water column has somewhat greater air injecting ability than natural gas at 7 in. pressure and an even greater difference exists between natural and butane gases at their respective normal distribution pressures of 7 in. and 11 in. The design of burners for adequate primary air injection, therefore, is more difficult for natural and liquefied petroleum gases than for manufactured gases.

Generally accepted dimensional limits for domestic gas appliance burners for good primary air injection are illustrated in Fig. 9. Information secured from research conducted at our Laboratories and at the Bureau of Standards has been condensed in this illustration in such a way as to show the length and slope of mixing tube, throat area ratio to port area for smooth and rough mixers, proper distance between orifice and throat, and

size of primary openings for good burner operation.

In addition to the above design characteristics, it is essential that temperature of the burner be kept as low as possible for good air injection. It has been shown for example that a reduction of from 2 to 8 per cent of the air theoretically needed for complete combustion could be generally expected for each 500F change in burner head temperature or in the temperature of the mixer tube. Greater reduction in air injection occurs in burners having long or small diameter mixing tubes than those having greater diameter or shorter tube lengths.

Effect of Pressure Variation

Variation in combustion chamber pressure also effects primary air injection, decreasing as the combustion chamber pressure is increased above atmospheric and increasing as the chamber pressure is decreased below atmospheric. The magnitude of this effect was found to be greater as the air shutter opening was increased and smaller as the gas rate was increased. The ordinary range of pressure established in the combustion chamber of domestic appliances seldom if ever is greater than .005 in. water column. Within the range of \pm .005 in. combustion chamber pressure, no significant changes will take place in the per cent of primary air injected.

It is a generally known fact that some of the recommended proportions and dimensions for acceptable burner design as shown in Fig. 9 can be modified very appreciably without greatly impairing primary air injection. Mixing tube lengths as short as one



"I've underpaid you so long, it hurts my conscience. Would you mind resigning?"

to two times the throat diameter have been used on approved appliances successfully. Likewise, considerable variation in the distance between orifice and throat can be tolerated and successful operation attained with the orifice located either in the throat of the mixing tube or a short distance on the outlet side rather than on the inlet. Questions have been raised about the necessity for a 2° slope of the mixing tube. There are also good possibilities for using means other than the usual type of air shutter for regulating and controlling the primary air entrained into a burner. In other words, our present design figures for domestic gas burner mixing tubes are so flexible they may be questioned as to accuracy.

Additional Research

Additional research has accordingly been undertaken by the Domestic Gas Research Committee on mixing tube design at the American Gas Association's Laboratories. While considerable progress has been made to date, final conclusions have not been reached. It is expected that the results of this research will reveal more accurate methods for calculating the proper length of mixing tubes and for establishing the proper slope from throat to burner head, settle the question as to whether an orifice should be located on the throat inlet or outlet, and determine in general the relative value of venturi tubes as compared to straight tubes.

It is further anticipated that from the more practical point of view, this additional study may permit better design of burners to the extent of possibly more correct sizing of mixer tubes with a resultant decrease in expense of manufacture. There is the further hope that specific information can be secured as to whether practical burners for injecting all air for combustion as primary air can be designed. While it is known that there is sufficient energy in the gas stream either at normal pressures or at some appropriately higher than normal pressure to inject adequate primary air for complete combustion, so far no practical design has been developed. This new research work, therefore, on mixing tube should throw light on this problem as well as to provide more accurate design data on burners of contemporary atmospheric Bunsen type.

APPLIANCE SERVICING

(Continued from page 117)

involved. Consumer shall be billed from office on 30-day basis. Charge will be made, of course, only when work is performed.

Public Contacts

1. Office Clerks

We will train all members of personnel who receive complaints either by telephone or at the office to ascertain as nearly as possible the exact nature of the trouble and to check on guarantee or warranty status if an appliance repair or adjustment is required. Training must include information on warranty coverage, as to time and extent (i.e., tank life on Automatic Water Heater, but not thermostat or pilot control; pilot outage or burner clogging on gas range within warranty but due to consumer's carelessness). Thus the statement: "There will be a charge for this service," or "There may be a charge for this service," prepares the customer. The time involved in explanation when the complaint is taken will be more than offset by the time saved when and after the job itself is done.

We will educate clerks in (1) the reasons and necessity for service charges from the company viewpoint, and (2) the advantages to the consumer of such service.

2. Salespeople

We will train all salespeople along the same lines as other personnel in so far as explaining charges to consumers goes. Training will, however, be given separately, as additional information must be given to be used when sale is made, especially regarding warranties, with particular emphasis on their limitations as well as their value. Special instruction will also be given salespeople on plumber-dealer contacts from a service angle, and service charge schedules will be fully explained for the benefit of both. Emphasis will be placed on the advantages to plumber-dealers on cooperation with our charge service plan, and salespeople will be trained to sell it.

3. Service Men

Training of service men will begin with a complete statement of company policy on charge service, together with reasons for such charges and a complete list of advantages to the customer. Also, information on benefits to the service department and its members will be supplied. This is the first step in teaching service men to sell charge service instead of apologizing for it.

The same information on warranties and free service will be given to service men as to other employees.

A time schedule for various services (under ordinary circumstances) will be

worked out with a view to keeping time within reasonable limits. The service men themselves will be consulted on this subject.

A combined, continuous program of education for service men and salespeople will be carried out, to cover: (1) New developments in appliances, (2) Discussion and explanation of unusual complaints and corrections.

Overall Cooperation

The commercial manager, service manager, and sales manager will at all times cooperate in training employees along the same lines and in carrying out the plan as outlined. Problems which arise are the problems of all three and must be handled as such. Difficulties of agreement will be referred jointly to the executive in charge for settlement.

The first and last objectives of the plan must be a well working operation and a satisfied consumer.

From every angle sales and service are so inextricably entangled that it is impossible to consider them separately, with any reasonable expectation of a successful conclusion.

On one hand, it is true service costs may be appraised fairly closely after the event without reference to sales. But sales policies, plans and procedures so definitely influence costs before the event that no plan can be made for one that does not consider both. On the other side of the picture, sales might appear to stand alone if it were not for the incontrovertible fact that the success of any major sales activity must depend on a good service policy. No guarantee or warranty will ever mean what it should so long as service is indiscriminate.

Considering our tremendous interest in dealer relations, it sometimes seems that little thought has been given to the effect of our service policies on their sales. We want them to be active and aggressive in pushing appliances which consume our fuel, yet often there is no clear cut service policy which they can understand sufficiently to approve or disapprove. We want their cooperation. To get it, a real understanding of service policy is as important as one of sales policy, if we are to get rid of many of the misunderstandings which have upset our plans in the past.

The economic aspect of servicing is clear cut. A cost of 80¢ per meter in natural gas, and \$1.30 per meter in manufactured and mixed gas operations, cannot be brushed aside as unimportant. The \$18,000,000.00 per year cost to the gas industry for service to customers is a major item in any language. If we can arrive at a policy, perfect a plan and institute a procedure which will turn this immense liability into any semblance of an asset we will have accomplished a great deal.

Gas Slide Rule Available

UTILITIES DISTRIBUTORS, INC., Portland 2, Me., are offering the UDI gas slide rule in two models for rapid calculations of problems linked with the gas industry.

The engineer's model is a 12½ in. duplex rule with two movable slides, and comes with a leather case and instruction manual, priced at \$15. In addition to common multiplication, division and square root, it calculates pressure drops, orifice capacities, burner port capacities, correlations of cubic feet and B.t.u.'s, and water heating costs.

Model K is a celluloid pocket edition, also in a leather case with manual, and sells for \$2.25. It calculates orifice capacities and pressure drops.

Personnel Service

SERVICES OFFERED

Manager-Engineer. Young man with 15 years' experience in the design, engineering, operation and management of medium sized gas properties desires to make change. Experienced in butane-air, propane, natural and carbureted water gas. Draft exempt and can secure release from present employer. Further information gladly furnished. (35) 1476.

Superintendent or Assistant in a carbureted water gas plant. 29 years' experience in all phases of plant operation, light or heavy oil, coke, bituminous gas coal or anthracite fuels, high or low pressure. Have had but two employers. Can report immediately. 1477.

Combustion Engineer. 12 years combustion engineering including technical, laboratory, design, and field—power and heating plants, industrial furnaces and heating processes. Exceptionally broad background in mechanical engineering. Will accept position with established firm which can offer post war security. 38, married, B.S. Degree mechanical engineering. 1478.

Production or General Superintendent with wide experience in the latest methods of manufacture and distribution of both Coal and Water Gas, desires position with gas company with opportunity to use his knowledge in securing better operating efficiencies. Married, draft exempt, excellent physical condition. A-1 References. Available on reasonable notice. 1479.

Young man with thorough knowledge of modern high and low pressure gas distribution practice, desires permanent position with future. Seventeen years of construction and maintenance experience in all phases. Letter giving particulars sent upon request. (38) 1480.

Controller or Accounting Executive: Graduate civil engineer, 20 years' experience production, distribution, sales manufactured and natural gas, electricity, petroleum. Accounting, budgetary and finance; systems design for office, sales, shop and warehouse; preparation manuals, procedures and convention papers. Top-notch physical condition. Seeks immediate interview leading to post-war activity; available shortly. 1481.

POSITIONS OPEN

Accountant—Natural Gas and Utility Experience: Must have good knowledge of gas operations and wide experience in general accounting, methods, and procedures of gas producing, transmission, and distributing companies. Headquarters in New York with some travelling required. Furnish full particulars. 0386.

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HEADQUARTERS, 420 LEXINGTON AVE., NEW YORK 17, N. Y.

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